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EDITOR'S COMMENTS

THIS issue of *The American Neptune* consists of a number of interesting and related articles, all of which are concerned in various ways with the naval and maritime history of the eastern area of North America. They begin with Eileen Marcil's "Ship-Rigged Rafts and the Export of Quebec Timber." In this piece, the author tells the interesting story of how in the 1820s two huge timber rafts were constructed in the Saint Lawrence and then rigged as ships and sailed across the Atlantic to Britain. These unusual timber exports were not to continue in this form, but they show an extraordinary virtuosity in seamanship and inventiveness by the Canadian capitalists who were responsible for them.

The next three articles, in various ways, deal with the maritime side of the American Civil War during the middle decades of the 1800s. The first is somewhat of a curiosity and tells how, according to Ralph W. Donnelly's "Revenue Marine Service: The Nucleus of the Confederate Navy", the Confederate States in the South were able to begin to form a war fleet by taking over some light revenue cutters and lighthouse tenders which had belonged to the federal government. None of these vessels played an important role in the outcome of the naval war between North and South, but they did at least give the Confederacy some vessels upon which it could rely until more satisfactory warships could be built at home or purchased abroad.

What follows is a piece by Bradley Rodgers entitled, "The Northern Theater in the Civil War. The USS *Michigan* and Confederate Intrigue on the Great Lakes." In it we find the interesting story of Southern efforts to seize the North's one effective naval vessel on the Lakes, the USS *Michigan*, and to use it in part to free Southern prisoners who were being held in a detention camp at Sandusky, Ohio. That the maritime side of the Civil War extended to the Great Lakes may come as somewhat of a surprise to most of us.

Finally, we have a long and extremely important article by William Still entitled "Monitor Companies: A Study of the Major Firms That Built the USS *Monitor*." In this piece, the author provides us with a view of most of the North's facilities for producing iron and steel ships and advanced marine steam engines during these decades. Those, which contributed to the construction of the *Monitor*, were located mainly in the New York City area. But some of them were in Buffalo and Troy and Schenectady in New York State and in the Baltimore areas as well. It may surprise some that at this time New York City was the leading center for this type of manufacturing rather than the Delaware River area, which some have referred to as "The American Clyde". However, that seems clearly to have been the case.

ARCHIBALD R. LEWIS

Salem, Massachusetts

Ship-Rigged Rafts and the Export of Quebec Timber

EILEEN REID MARCIL

WHEN the master shipbuilder John Wood of Port Glasgow died in 1811, his sons, John and Charles, then twenty-three and twenty-one years old respectively, took charge of his yard. The keel of Henry Bell's steamboat *Comet* had been laid one month earlier, and her construction became a series of "build up and tear down" as the brothers redesigned and redesigned her until eventually they and Bell were satisfied and the first trading steam vessel in Europe was launched.[1] Together, the Woods went on to design and build another eighteen Clyde steamers and other craft, and in the process became highly competent at their work. The vessels designed by Charles included a ceremonial barge for service on the Rhine, bought by the king of Denmark, and the steamer *James Watt*, 120 feet long with 100 h.p., built in 1820. In designing the *James Watt* Charles decided that, "as she was not to be propelled by masts and sails, with their leverage to depress the forebody of the vessel, but by paddles, which would impel her in the same manner as oars, she should be formed as the row galleys of the ancients were, with her water lines exactly the same in the forebody as the afterbody and the midship frame equidistant from the stem and sternpost." His *James Watt* revolutionized steamboat design.[2]

The brothers' partnership came to an end in the early 1820s when Charles found backers for an idea he had conceived and developed for transporting timber from Canada in raft ships, or, as he chose to describe it, "rafting" timber from Quebec. William Gilkison, merchant, of Glasgow, David and Robert Gilkison, shipmasters, of Port Glasgow, Christopher Richardson, John Hodgson, Thomas Draines, Donald McIntosh, merchants, and James Walker, civil engineer, all of London, were not the backers Charles had originally hoped to interest, but he was grateful for their financial support. Charles was given a three-year contract, during which he was to build two vessels. What the financial terms of his contract were, I do not know. Wood had a sufficient reputation for the vessels to be insurable.[3]

And so, from 1823 to 1825, which was a period of extraordinary shipbuilding activity at Quebec, not only were all the shipyards there operating to capacity, but two very unconventional vessels were built in a large cove in what is now Saint Petronille, on the southwest tip of the Isle of Orleans.[4] The 3,690-ton *Columbus* and the 5,294-ton *Baron of Renfrew* were ten times larger than the average vessel under construction in the port and far larger than any vessel afloat. They were built entirely of square timbers and were designed to be taken apart on their arrival in London, where the timber would be sold.

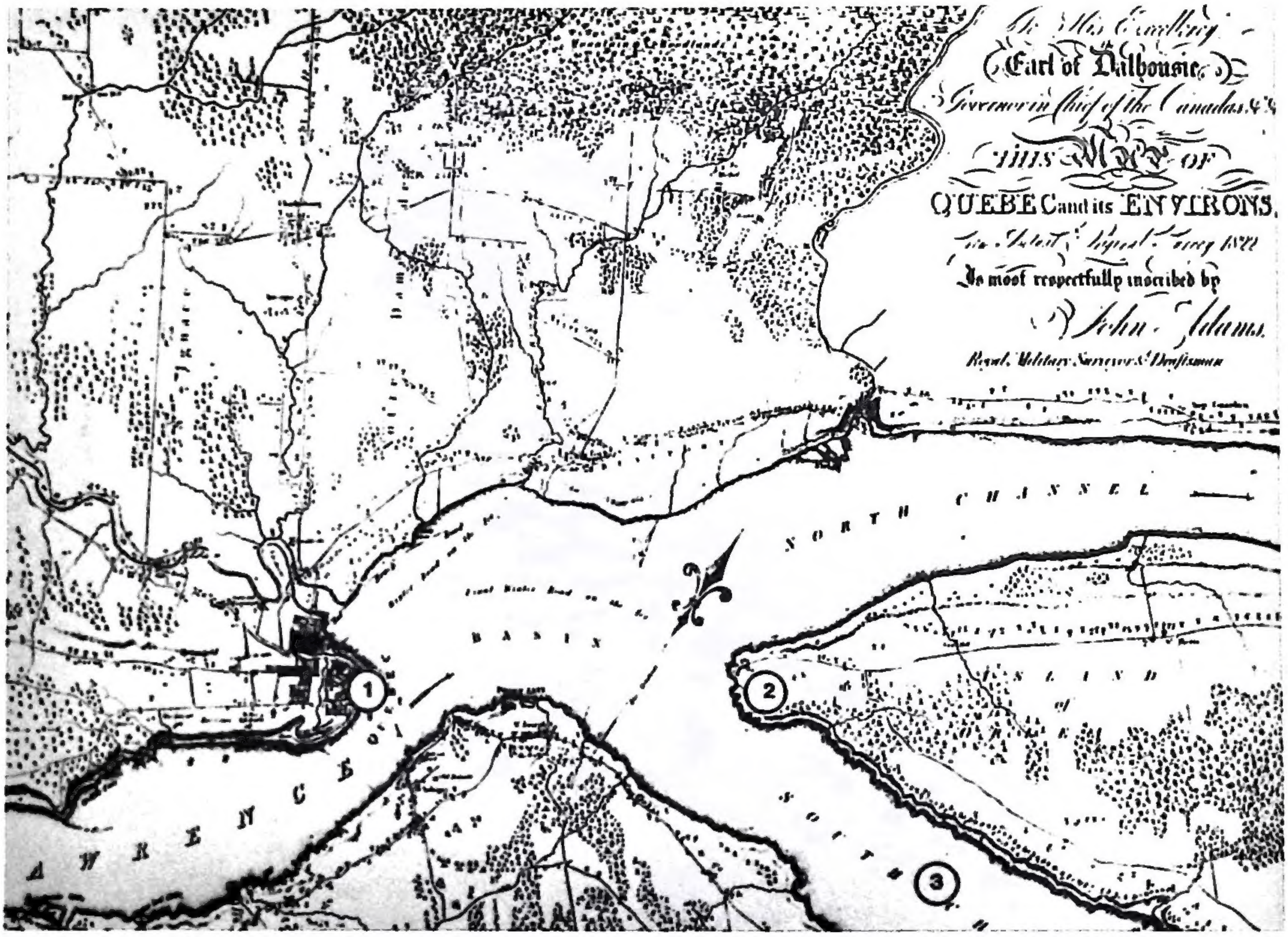
The reason for their construction was that when Napoleon blockaded the Baltic in 1806, the British Admiralty had found itself obliged to shelve its abhorrence for North American timber, and by abhorrence I refer to the attitude of men like Sir Robert Seppings, for instance, who stated emphatically at a later date, "I consider the English oak as superior to the American as the Baltic fir is to the fir of that country . . . The American

1. J. Scott Russell, "On the Late Mr. John Wood and Mr. Charles Wood, Naval Architects, of Port Glasgow," paper read at the Second Session of the Institution of Naval Architects, on Friday, 1 March 1861, *Transactions* 142, with thanks to Michael Moss, archivist, University of Glasgow, who brought it to my attention; "The 'Comet' Centenary Supplement," *The Glasgow Herald*, 24 July 1912, with thanks to Mrs. James Scott, Bowling; J. Craig Osborne, "John and Charles Wood: 18th [*sic*] Century Shipbuilders," typescript in the Mitchell Library, Glasgow, with thanks to Isobel Couperwhite of the Central Library, Greenock.

2. Russell, pp. 142-43, 148.

3. Charles Wood, *Ballast*, pp. 3, 4, 6; Shipping Register, Port of Quebec, 12/1824.

4. Prior to 1870, the area formed part of the parish of St. Pierre.



The port of Quebec, showing the city of Quebec (1), the southwest end of the Isle of Orleans (2), and the South Channel used by shipping to and from Quebec (3). (*The map of Quebec and its Environs,* John Adams, 1822, published 1826. National Map Collection, Public Archives of Canada.)

oak is very bad. I think of the two, the oak is worse than the fir."[5] As a direct result of Napoleon's action, however, Canada would soon be seething with Admiralty timber contractors and the coves around Quebec became depots for enormous quantities of timber waiting to be exported.

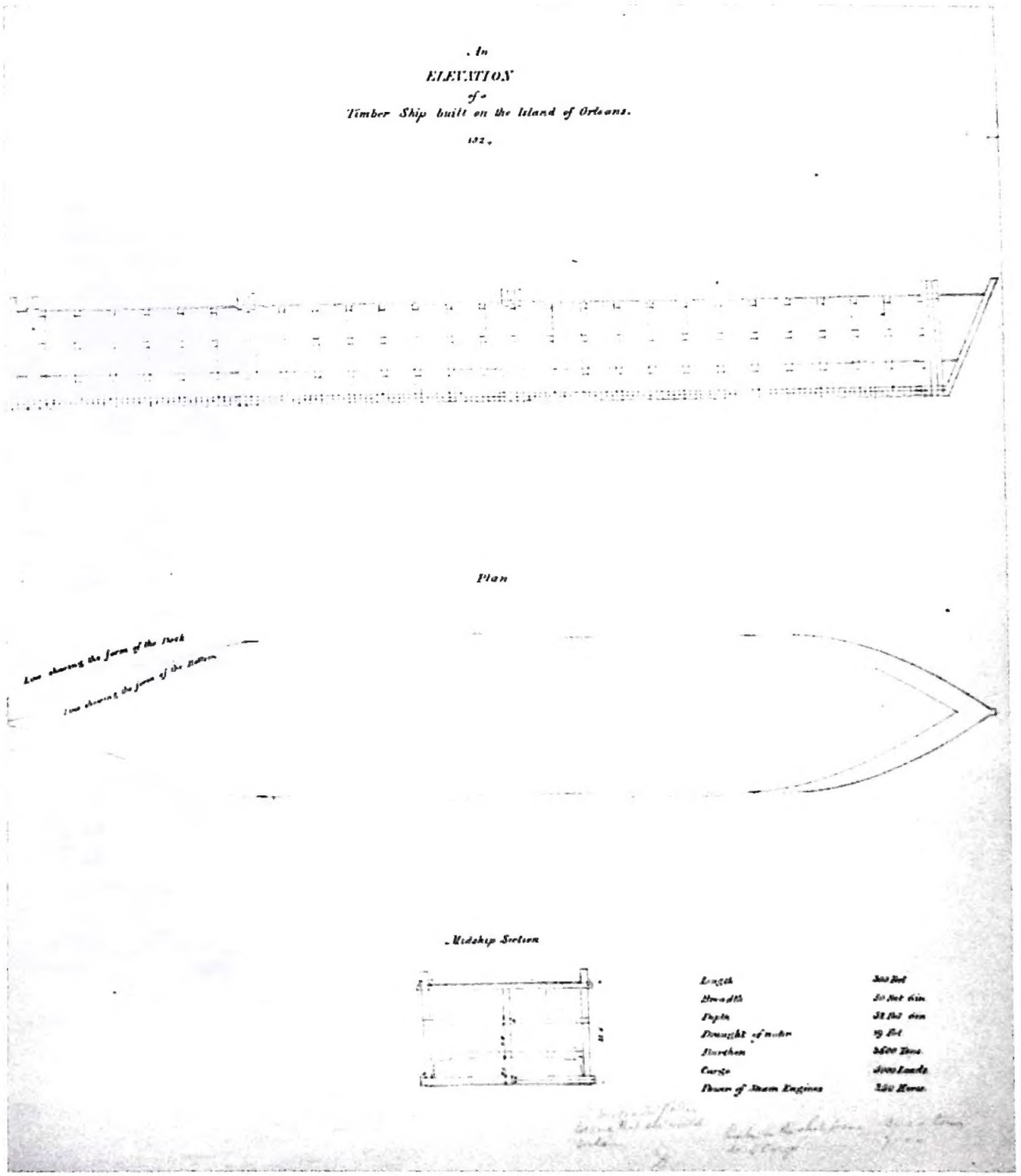
At first, the timber merchants, wary of a change of heart on the part of the British government, held back on their investment in Canada, and it was not until the protectionist laws passed in 1821 imposed a fifty-five shillings per load duty on timber from northern Europe, as opposed to a ten shillings per load duty on Canadian timber, that the Quebec timber trade was unleashed.[6] At a later date it was written and since has often been repeated that the whole idea behind the construction of the *Columbus and Baron of Renfrew* was to avoid the payment of customs duty,[7] but this was not Wood's purpose. Rather, his primary objective was to transport the huge timbers obtainable in Canada in the easiest manner possible and at the least cost.[8] As John McTaggart wrote in his account of the three years he spent there,

5. *Minutes of Evidence of the Select Committee Appointed to Consider the Means of Improving and Maintaining the Foreign Trade of the Country (London, 1921).*

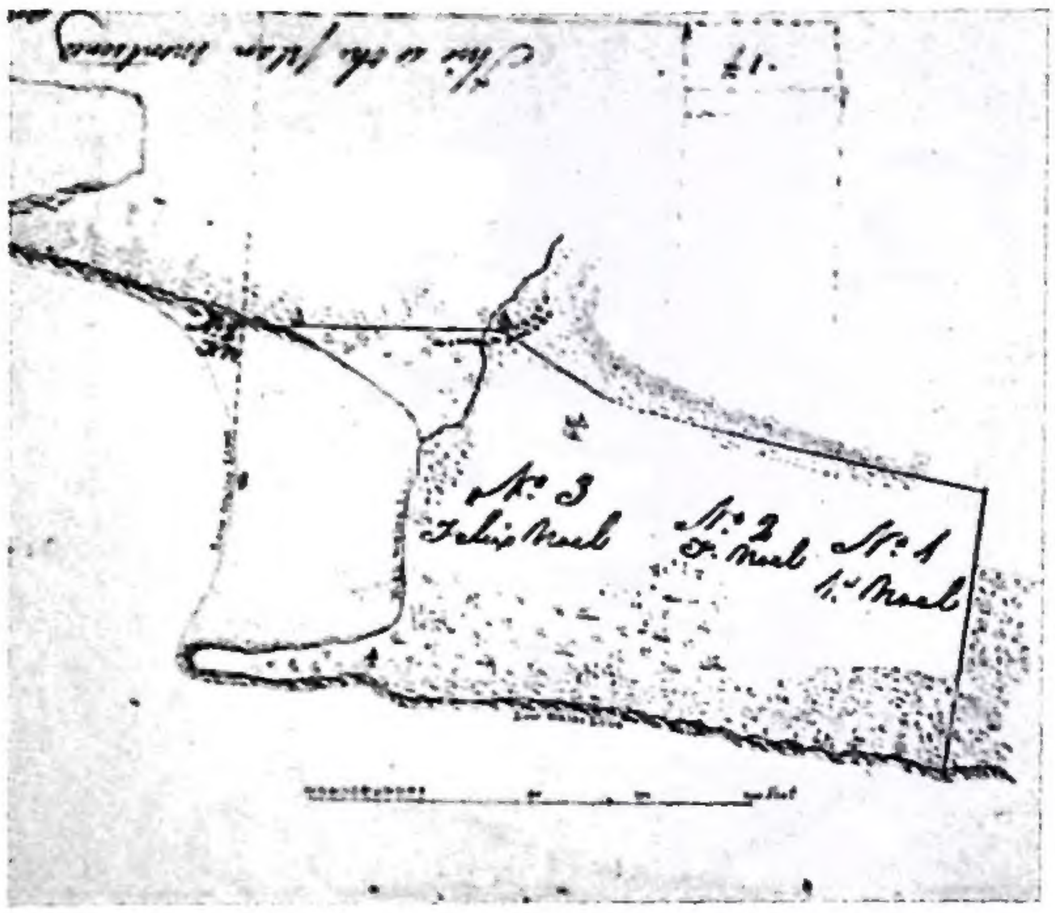
6. Gerald Graham, *Sea Power and British North America 1783-1820: A Study in British Colonial Policy* (Cambridge, Mass., 1941), pp. 150-52.

7. E.G., William Wood, *The Storied Province of Quebec* (Toronto, 1931), p. 173; F. W. Wallace, *Wooden Ships and Iron Men* (Boston, 1937), p. 14.

8. *Annals of Lower Canada for 1925* VIII.



Plans of the *Columbus*. These hithertoo unpublished plans were presented to the Governor General of Canada, Lord Dalhousie, by Charles Wood. The pencil inscription reads, "Mr Woods & Mr. McKellar told me that she would contain—timber in the ship frame 3000 tons, do. of cargo 7000 tons," signed "D" Lord Dalhousies. "An Elevation of a Timber Ship built on the Island of Orleans, 1824," Dalhousie Collection, 85.119.22, neg. N-15,194. Courtesy of the Nova Scotia Museum, Halifax, N.S. Special thanks to Marie Elwood, archivist, and to James Lambert, who brought the plans to my attention.



The land that Charles Wood rented "at the westerly end of the Isle of Orleans," where he had permission "to erect such buildings, pits and works as he may see fit," consisting of "about 3 arpents 8 perches in width at the extremity of the depth but of greater width at its front along the River St. Lawrence, together with the cove and the beach in front . . . with liberty to cut and take away trees, etc." (Plan attached to the lease between Pierre, Francois, and Felix Noel, and Charles Wood, dated 4 August 1823. Greffe of the notary L. McPherson. CNI-197, neg. 83-7-31, Archives Nationales du Quebec.)

"The timber merchants regret that . . . [the *Columbus* and *Baron of Renfrew*] were not found to answer; as they cleared their ponds and coves of lumber, and of such pieces too, as no other ships would have anything to do with: The Saint Lawrence, for once, was swept of all its 'heavy sticks'; they could not be found too bulky."[9] There were many advantages to clearing out the coves, perhaps not the least the fact that timber that lay around exposed to the elements year after year offered a fertile breeding ground for dry rot and could become a source of infection to other timber.

The large bay on the Isle of Orleans that was leased by Wood in 1823 measured 600 feet across the back, with greater frontage.[10] The necessary tradesmen's shops and accommodations were thrown up, and in short order the 301-foot keel of the *Columbus* was laid. She was to be 51 feet wide and 29.3 feet deep, and as her huge structure took shape, it inevitably became the talk of the town and of all those passing through. Many doubted that such a vessel would ever float, thinking she would remain on the blocks, a monument to the stupendous folly of her projectors. But with four thousand tons of timber, that had been run through the bow and stern ports by horses, already aboard, she was safely launched on 14 July. The crowds had begun to gather the night before, and the river was alive with "no less than seven steamboats and an amazing number of sailing boats." The *Columbus* slid majestically down her 600-foot ways into the Saint Lawrence, taking one minute to reach the water and creating little swell on her entry—even those in the smallest boats were hardly tossed. As soon as she lost way, she was taken by the steamboats *Swiftsure*, *Lady Sherbrooke*, and *Malsham* to the Orleans channel where she was anchored. The military bands aboard the steamboats treated the onlookers to a concert as they toured around the island, the band of the 71st Regiment on the *Swiftsure*, of the 68th on the *Lady Sherbrooke*, and the pipers of the 71st aboard the *Laprairie*. Wood had decided to show his faith in his project and see to its safe conclusion by taking passage to London on the *Columbus*, but before doing so he laid the keel of the *Baron of Renfrew*, having taken it upon himself to modify his plan and have her built 10 feet wider and 8 feet deeper than the *Columbus*.[11]

The *Columbus* weighed anchor on 5 September under the command of Capt. William McKellar and, with her crew of ninety Scots sailors,[12] was towed down the river by the steamboat *Hercules*. It was then that the problems began, and we have Charles Wood's published letters to James Walker, one of the backers, to give us his version of the facts. It appears that the captain did not have the same faith in the *Columbus* that Wood had: he had openly predicted death and destruction even before leaving Canada and was prepared to abandon ship from the outset. He seems, moreover, either to have had no knowledge of the Saint Lawrence or no understanding of how the *Columbus* might sail, and probably neither, and was far from conscientious to boot. Though Wood had "suggested" that he sleep by day and watch by night while in the narrow waters, on the first night out he gave the helmsman the course to take and turned in, and later abused his mate for putting her about to avoid running

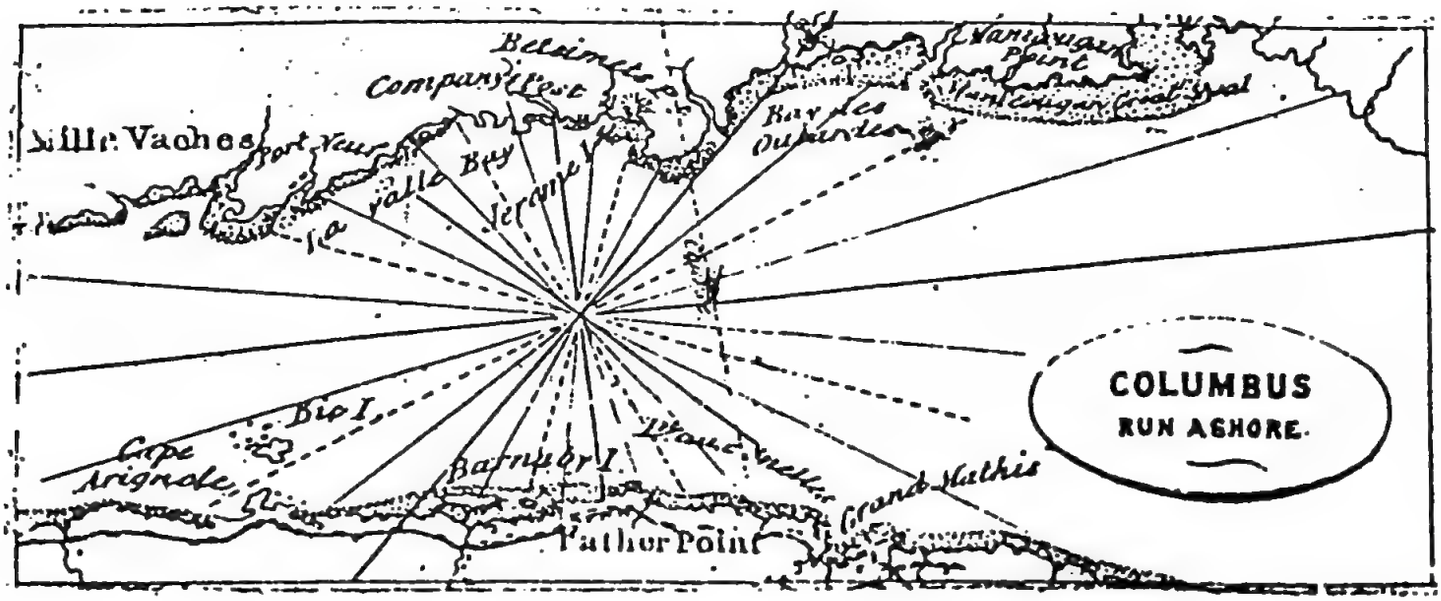
9. *Three Years in Canada . . . 1826-7-8* (London, 1829), p. 87.

10. Lease, Noel with Wood, 4 August 1823, greffe of notary L. McPherson, Archives Nationales du Quebec.

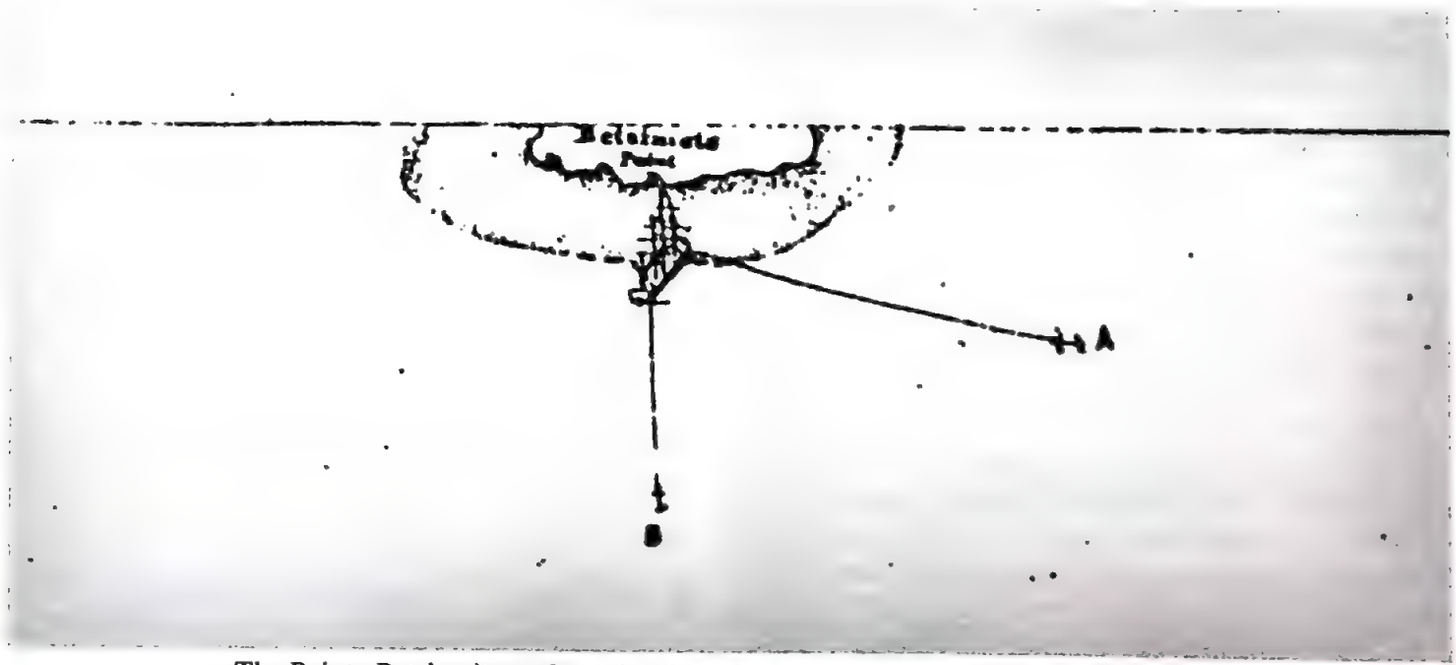
11. *Quebec Mercury*, 31 July 1824; London *Times*, 9 November 1824, 2d; Charles Wood, pp. 9, 15.

12. *Quebec Mercury*, 29 July 1824.

ashore. He adopted the same behavior the following night, giving the fateful instructions that put her on the Point de Betsiamites, although he had been warned to hug the south and avoid the north shore, above all the Manicouagan. In the jettison of a part of the deck cargo of deals and the heaving-off that ensued, Wood forcefully countermanded the captain's orders to cut the only remaining cable aboard, directing that a few fathoms be heaved out instead to put matters right. Once across the Atlantic, the ship might again have been stranded, this



The course given by the captain. (From Wood, *Ballast*, p. 15.)



The Pointe Betsiamites, where the *Columbus* grounded. (From Wood, *Ballast*, p. 16.)

The course taken by the *Columbus* across the Atlantic. (From Wood, *Ballast*, p. 4.)

time on Saint Catherine's Spit, at the "back of the Isle of Wight," had the instructions given by the captain—once more before turning in—been obeyed.[13]

Meanwhile, the sobriquets that the Canadian and British press had begun to bestow when the *Columbus*'s keel blocks were first laid intensified—"the great timber ship," "the raft ship" or "the large timber drogher" gave way to "this so-much-talked-of vessel," "the ponderous mass," "the Leviathon [*sic*] of the deep," "the stupendous vessel," "the vaunted Colossus of the deep," etc. According to her registry, however, she was a four-masted ship,[14] though later she would usually be described as a four-masted barque.

On 13 October the London *Times* wrote in anticipation:

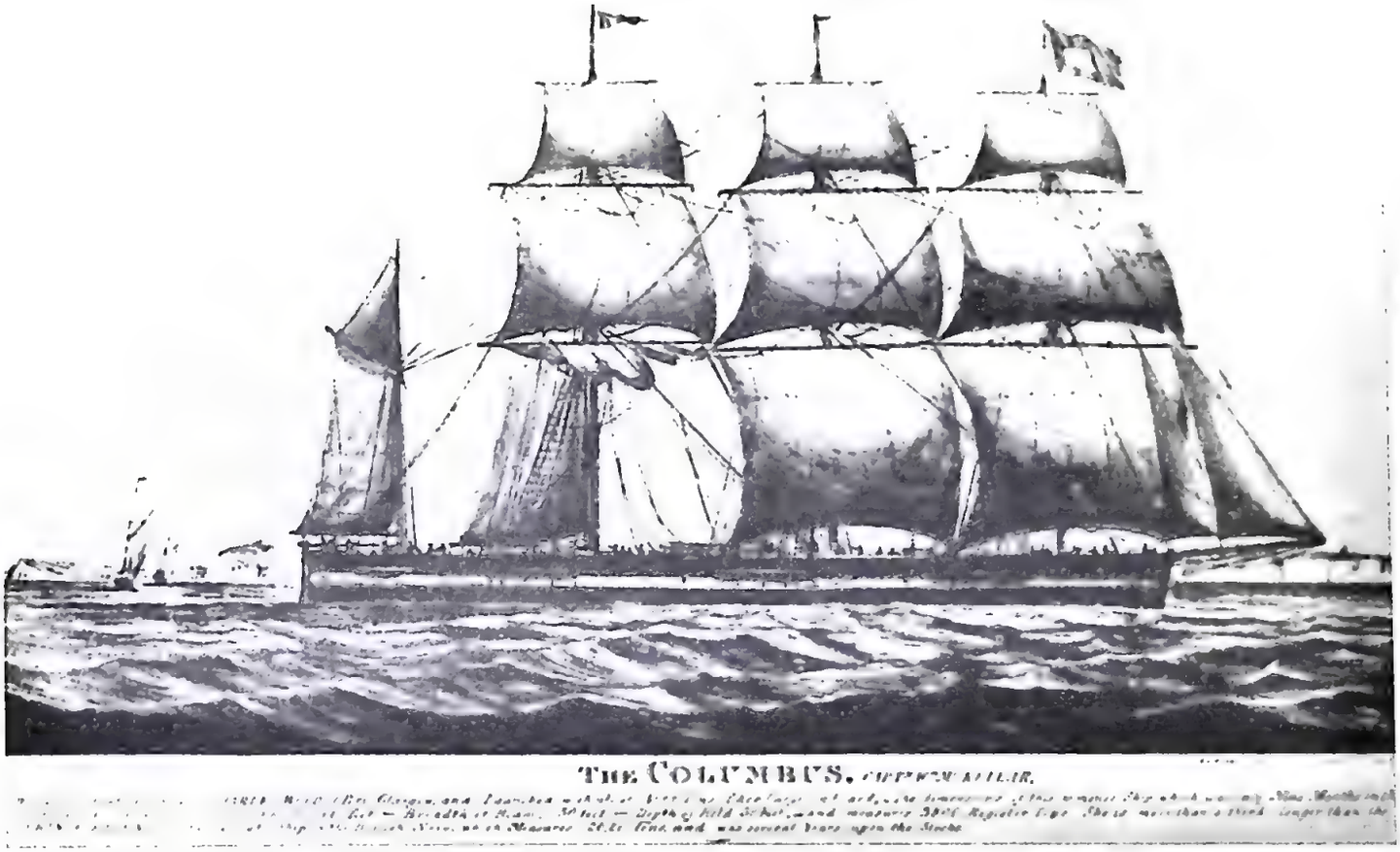
> We are now looking out for the arrival of the Leviathon [*sic*] ship Columbus from Canada. Should she surmount the perils of the ocean, she will sail up as high as Blackwall, to which the whole city will empty itself to witness this extraordinary spectacle. The gentlemen of Lloyd's and their families will be sufficient in themselves to fill the steam-boats.[15]

The *Columbus* did surmount the perils of the ocean and two weeks later they were able to report:

> The large ship *Columbus* from Quebec arrived at Deal on the 27th Oct. and cast anchor near the Grand ship *Ramilies;* notwithstanding this man of war is of the first class, she appears no larger than a canal boat, along side of this Leviathon [*sic*] of the new World. At the moment that the *Columbus* appeared in sight, she appeared like a floating island, and her masts like Church steeples. She is to be towed to Deptford by steam boats, to be discharged.[16]

It was not without bitterness that Charles Wood landed in London, the trip having been marred through the inadequacy of the captain. Charles's instructions as to where the *Columbus* should be grounded were overridden, two of the partners in the scheme having insisted

13. Charles Wood, pp. 15-18.
14. Quebec 12/1824.
15. *Montreal Gazette*, 14 December 1824, citing "A London paper of the 13th October."
16. *Canadian Magazine and Literary Repository*, II:62, December 1824, p. 62.



The 3,690-ton raft-ship *Columbus*. (Drawn on stone by Jos. Harweed, S. Vowles, Lithog., s.d. Photo: Courtesy William Scott, great-grandson of Charles Wood.)

that she be laid on ground that had a curve of 15 feet in 300, thereby breaking her back.[17]

However, in spite of the difficulties, the *Columbus* and most of her cargo was safely delivered, and the execution of the project was generally conceded, though sometimes grudgingly, to have been quite a feat. Her line was considered ugly, her masts ill-proportioned, her rigging of a temporary speculative description; she was built with no regard to beauty and little attention to the principles of naval architecture. The *Times* reported that she worked easily and surely, that she was perfectly under the government of her rudder, that she was, in general, steered with facility by a man and a boy, that she went from nine to ten knots when sailing free and that at six points and a half from the wind she went six knots and made little leeway, but also doubted that she could actually possess all the good qualities attributed to her and could not believe that she ever sailed at six points and a half, or even at seven points from the wind, nor that she ever went at nine or ten miles an hour. Yet, it was admitted that she was well worth visiting, Great crowds gathered to stare at the extraordinary sight; some paid the high price of the boatmen to get a nearer view; and some even paid an extra two shillings to go aboard.[18] Having completed his mission, Charles Wood wasted no time in returning to Quebec.

His backers, on the other hand, having studied the finances of the undertaking, congratulated themselves, and began making arrangements to send the *Columbus* to New Brunswick to fetch a second cargo of timber. She had, as we know, been designed for just one trip. She left Deal on 21 April, encountered a heavy gale and did not reach her destination. Fortunately, all hands were saved.[19]

17. Charles Wood, p. 18.

18. *Times*, 9 November 1824.

19. *Quebec Gazette*, 6 May 1825; *Times*, 31 May 1825.

Showing where the *Baron of Renfrew* was stranded and run ashore. (From Wood, *Ballast*, facing p. 20.)

Meanwhile, on the Isle of Orleans, the logs forming the huge sides of the *Baron of Renfrew* were almost all erected by 11 November. Work continued through the winter and she was ready for launching by 18 June. This time the skeptics were fewer and the crowd was once again great—but disappointed. After travelling along the ways about half her own length, the *Baron* settled down and no amount of tugging by the steamboats would set her moving. She was eventually launched a week later, auger holes having been drilled in her ways, filled with gunpowder and set off, to shake her into motion. Not having enough advance warning to assemble, the would-be spectators were cheated of the thrill of the launching,[20] but made up for it by taking pleasure trips aboard the steamboat *Laprairie* to visit her, as she lay waiting for the Atlantic crossing. These excursions had in fact been going on since the opening of navigation at the end of April, when she was still on the stocks.[21] In view of the tremendous amount of pumping that was required on the *Columbus*, Wood had taken the precaution of buying the late John Goudie's steamboat *Experiment*, transferring the engine to the *Baron* to work the pumps as well as to heave the cargo in and out, and hiring a mechanic to take charge of it on the trip over.[22]

The great craft set sail with appropriate ceremony on 23 August under the command of Capt. Matthew Walker, and once again Wood was aboard. She arrived safely in the North Sea; the pilot boarded, as did David Gilkison, one of the owners. Charles, whose only thought was to see her safely arrived, suggested the various courses open to them, but was told in no uncertain terms that it had been decided to anchor her there and the best thing *he* could do was "to get the steamers." Reaching land, he posted to London and returned with two steamers, only to find that the *Baron* had been stranded and driven ashore on the French coast.[23]

The cargo had included:

43634	Deals, average measurement 6 tons per 100 ps.	2616 tons
517	Ps. hard wood 30 cu. ft. ea. and 11 knees	388
3207	Logs Pine	4009
24659	Pipe staves 24 M. standard, 12 tons per M.	288
75765	W.I. staves 75 M. pieces 3 tons per M.	225
84	Masts averaging 24 ins. ea, 8 ton per M.	672
337	Spars averaging 24 ins. ea, 2 tons per M.	674
4782	Ash oar rafters 24 ps. 1 ton per M.	200
23098	Ps. lathwood 160 ps. cord is 144 cord 3 ton M.	432
34852	Treenails, 4000 of 12" make a load	11
	Amount of cargo in tons	9515

Part of this was taken off and landed at Harwich when the *Baron* first grounded,[24] while a great deal more was secured and taken above the highwater mark on the beaches between Calais and Dunkirk immediately following her stranding. Fortunately, through the courage and skill of the Dover boatmen, there was no loss of life.[25]

20. *Quebec Mercury*, 18 and 25 June 1825.

21. See notices, ibid., 9 August 1825 and *Quebec Gazette*, 25 April 1825.

22. *Quebec Mercury*, 19 July 1825; Wood hired Charles Laing, an engineer, to set up and afterwards work the steam engine, for which he was to get 10/- per day and £30 on his discharge in London for his passage home. Engagement, Laing to Wood, 5 July 1825, greffe of H. Griffin, Archives Nationales du Quebec, Montreal.

23. Charles Wood, pp. 18-20.

24. *Times*, 19 October 1825.

25. Ibid., 27 October 1825.

Charles was ready and anxious to go immediately to France to make the necessary arrangements to "buy in" at the sale of the cargo, and dispose of it there, but was prevented from doing so by the two partners Richardson and Drane, who were determined to handle the matter themselves. They not only caused problems with the French authorities through their underhanded methods, but, rejecting Wood's directions as to the manner of "buying in," mishandled the matter so completely that at the end of the sale it turned out that three-quarters of the wood had not been sold at all, and a second sale had to be arranged. According to Charles, the bungling cost £10,000 and he was obliged to spend the best part of a year in France putting matters to right.[26] A full nine months after the stranding it was reported that a

> considerable part of the cargo of the Baron of Renfrew, put up as rafts and strongly bound with ropes and chains [had been] . . . taken to England in tow of a steamboat. Two of these rafts [had] left France on Thursday 13th July and were safe within the gates of the Commercial Docks, Rotherhithe, on the 15th. These rafts contain from 15 to 20,000 cubic feet of timber. On the top of one of them came the Baron's foremast, a single tree of between 80 and 90 feet in length.[27]

Yet, Charles was not only made the scapegoat, but when he protested, rumors were circulated about his incompetence and he was refused a chance to clear himself. In 1836, the year in which he published his correspondence with James Walker from which many of these facts are taken, he was still fighting for his honor, demanding that Walker and his partners write a statement absolving him of blame, or be served with a libel suit.[28]

Meanwhile, thoroughly disappointed, he had turned to other matters and, typically, one at least was a tremendous challenge. He went to London determined to get the old tonnage laws changed so that they would reflect the true capacity of a vessel for carrying profitable cargo, and he succeeded in doing so, despite having to pit himself against such heavyweights in the shipbuilding world as William Laird.[29] According to John Scott Russell, who described Wood as a "genius in his way," the change was one of the greatest benefits conferred on Britain during his lifetime, and one for which shipbuilders were "in great measure, and originally, indebted to [Charles Wood]. . . ."[30] Even James Walker, one of the partners in the raft ship venture, who treated him so shabbily over that, wrote to Charles: "I like your paper on ship-building very well, and have given it circulation. If the points you name are at all attended to, they must form a feature in any reasonable act."[31]

Charles Wood had not intended his plan to raft timber from Quebec to London to come to an end after the construction of two vessels. He had planned to build at least a dozen, to carry 20,000 tons of cargo each year.[32] He himself was convinced that the project

> was marred alone by meddling, by petty spite and jealousy, and the want of honourable principle, on the part of the home managers and others . . . inducing them to change the project, to mutiny against . . . [Wood] in the conducting of it—sacrificing the profits and the property, and bringing loss upon the heads of the underwriters as well as owners where there was no real risk; and by a fateful piece of trickery played off upon Lloyds . . . bringing rafts as an insured risk into entire disrepute. . . .[33]

But what really did go wrong? Was Charles Wood right in his condemnation of the part played by the captain and several of the partners? Or did he expect too much of ordinary men? Or was the truth somewhere between? Perhaps the paper on John and Charles Wood that John Scott Russell read before the Institution of Naval Architects in 1861 holds the key, for Russell went out of his way to heap praise on Charles Wood, who had died fourteen years before. Russell was no doubt aware of the extent to which Charles Wood had been wronged.

Appendix A

Extracts from a description of the *Columbus*, London *Times*, November 1824, given in full in F. W. Wallace, *Wooden Ships and Iron Men*, 324.

The vaunted Colossus of the deep is at length accessible to the investigation of the curious, however timid they may be, and the lovers of sight-seeing may gratify their whim and fantasy without encountering a heavy sea, a fearful lee-shore, or blue-water banyan days.

26. Charles Wood, pp. 20, 25-27.
27. *Quebec Gazette*, 21 August 1826.
28. Charles Wood, p. 32.
29. Ibid., pp. 29-30.
30. Russell, p. 146.
31. Charles Wood, p. 22.
32. Charles Wood, p. 3. What is meant by "trickery" is not clear. According to an account in the *Annals of Lower Canada for 1825*, p. 153, the proprietors were not fully covered by the insurance settlement for the second voyage of the *Columbus*, receiving "£5,000 from Lloyd's, £2,000 from Dundee, £3,500 from Glasgow and £3,000 from the Patriotic Company."
33. Ibid., p. 8.

Thanks to branch pilots, steamboats, warps and the capstan, the *Columbus* is now off Folly House, in Blackwall Reach, where she is likely to be easy in her berth without moorings or even a kedge. Her arrival has excited so much interest and conversation that, though we have already given her dimensions, the nature and quantity of her cargo, and some account of her appearance, we are induced to recur to the subject and speak from "occular demonstration." The *Columbus* is of the following dimensions: Length of keel 294 feet; length of deck, 301 feet; breadth of beam, 51 feet 4½ inches; depth of hold, 29 feet 4½ inches; from the top of her bulwarks to the bottom, outside 37 feet; tonnage 3690 tons; mainmast above deck, 72 feet; best bower cable, 27 inches; anchor, 80 cwt., 2 grs., 17 lbs. She is of perfectly flat bottom, with a keel of about 12 inches, wall sided, sharp forward, and rather lean aft. Her cargo capacity is 6300 tons.

The *Columbus* is exceedingly deceitful in her appearance, especially when she is seen end on; she scarcely looks half her size. She is like a wedge forward, has no cutwater, is wall-sided, carries her beam, we should imagine, to abaft the mainmast, for she had four masts and has a square tuck. Her run is gradual, and from her length she looks extremely lean. She sits low in the water. A tolerable-sized light West Indiaman, or a 38-gun frigate in cruising trim, appear almost as lofty in the hull when you are alongside.

. . . She has two sets of beams; the upper ones, which sustain the deck, project through the sides. She has also an inner frame, for the better security of her cargo—to prevent any starting of the timber.

. . . her galley and bitts are above deck; and between the foremast and the first mainmast there is a fore hatchway and a cable tier and messing place for part of the crew, which looks like a rude gap made in her cargo after it had been stowed. the height from the timber on which the cable is coiled, and where the men have 2 or 3 berths, is about 6 feet; so that there must be even there about 30 feet deep of timber. But from the first mainmast to the second, the cargo runs from deck to keelson. And abaft the latter mast, close to the wheel, where the binnacles stand, is a place for the accommodation of the officers and the rest of the crew. The provisions, we believe, are stowed abaft the try-sail mast. Her rudder is hung like that of any other ship, but its head comes above the taffrail, and the tiller is above deck.

Appendix B

Description of *Baron of Renfrew (Annals of Lower Canada for 1825)*

. . . her length was 303 feet; beam 60 feet; hold 35 feet; length of main mast above the deck 75 feet and whole length 104 feet; main yard 72 feet; between decks 14 feet; draught of water 24 feet when loaded; the tiller 28 feet long, 1 8-12 foot square; tonnage 5280 tons; chain cable 120 fathoms long; 14 inch link and 7 inches over; hemp cable 26 inch rope 100 fathoms; weight of anchors 74 cwt. and 87 cwt.; 10 feet wider and 5 feet deeper than the Columbus; a man going round the capstan at the end of the bars 31 times, travels a mile; and going round the deck 11 times a mile; had five decks, carries about 9000 tons of timber, and required in its erection 12 tons oakum and 125 tons iron bolts.

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Revenue Marine Service: The Nucleus of the Confederate Navy

RALPH W. DONNELLY*

A FACT largely overlooked in the naval history of the Civil War is the important part played by a relatively small number of Federal revenue marine cutters and lighthouse service vessels which were seized for service in the seceding states and the Confederacy. The *Alexandria* (Virginia) *Gazette and Virginia Advertiser* rather accurately portrayed this situation in a news item on 22 March 1861, "The Navy of the Confederate States now consists of six cutters, formerly in the Revenue service—two steamers, a brig, and several gunboats. Active preparations are making for procuring and arming other vessels."

The service of these ships refutes the inaccurate conclusion expressed in the navy volume of *The Photographic History of the Civil War* that all the former Federal revenue cutters "were fitted out for privateering as quickly as possible and went to sea with varying fortunes." Actually, these small craft *were* the early Confederate navy.

These small craft which first carried the Confederate flag were the former revenue marine cutters *Washington, Robert McClelland, Lewis Cass, Henry Dodge, William Aiken,* and *Ewing,* and the lighthouse service tenders *Alert* and *Minot.*

THE REVENUE SCHOONER *Washington*

The revenue cutter *Washington* was built at Baltimore in 1837, but she was rerigged as a brig the next year. For a period of twelve years, 1840 to 1852, she was on loan to the coast survey, but in 1852 she was returned to the revenue marine service.

At the time *McClelland* was ordered from New York to New Orleans before the war, her orders of 1 September 1860 were to exchange officers and crew with the cutter *Washington* which was then to proceed to New York for repairs. Capt. Robert K. Hudgins, an experienced revenue service officer, was to superintend her repairs which were rescheduled to be done at New Orleans.

The authorities of the state of Louisiana seized *Washington* at her Algiers (New Orleans) dock on 31 January 1861. Captain Hudgins, a Virginian, declined to continue to serve as superintendent of repairs under the state of Louisiana and returned to his home. He later entered the service of Virginia in her revenue service.

When Hudgins refused allegiance to the state of Louisiana, Capt. John G. Breshwood of *McClelland* was detached and assigned to superintend the repairs to *Washington.* It was actually more than a repair job; it was a complete reconstruction from her keelson up with new material. The work was done by John Hughes & Co., of Algiers, who incurred the wrath of Frank H. Hatch, the collector of customs at New Orleans under the Federal, Louisiana, and Confederate governments.

Hatch organized his objections into six specific

* In addition to those sources designated by footnote entries, use was made of Howard Chapelle, *History of American Sailing Ships;* William M. Robinson, Jr., *Justice in Grey* and *The Confederate Privateers;* Stephen H. Evans, *The United States Coast Guard, 1790-1915;* Arthur James Fremantle, *Three Months in the Southern States, April-June 1863;* Frank Moore, ed., *The Rebellion Record,* vol. I; William J. Tenney, *The Military and Naval History of the Rebellion in the United States;* Robert W. Neeser, *Statistical and Chronological History of the United States Navy 1775-1907;* and U.S. Naval History Division, *Civil War Naval Chronology 1861-1865.*

Also used were selected issues of *Harper's Weekly,* the *Alexandria* (Virginia) *Gazette and Virginia Advertiser,* the Washington *Star,* the New Orleans *Evening True Delta,* the Augusta, Georgia, *Chronicle and Sentinel,* and the New York *Times.*

Manuscript material from the U.S. National Archives included *Record of Movements: Vessels of the United States Coast Guard 1790-December 31, 1933* (2 MSS. vols.), *Log Book, Cutter William Aiken (Jan. 1, 1859-April 21, 1861)* in Record Group 26; *Pardon & Amnesty Papers,* Microcopy 1003; in Microcopy T-829, Roll 107, *Transfer Roll, C.S. Schooner 'Alert' dated March 31, 1862;* and file of Robert M. Rogers, Microcopy 260, *Confederate Naval and Marine Personnel: Reference Cards and Papers,* Roll 7.

charges which he asked John Hughes & Co. to answer. The charges were:

1. That the vessel had been found totally decayed and ought not to have been repaired,
2. That it should not have been done by days' work,
3. That the days' wages allowed ($3.25) were too high,
4. That the charge of $60.00 per thousand for cypress lumber dressed on both sides was exhorbitant,
5. That the mahogany and white pine used on the work was unnecessarily expensive lumber for the job, and
6. That the work was done in a style and extravagance entirely unsuited for a revenue cutter.

Although John Hughes & Co. answered each charge with apparently logical explanations, usually referring to the order of the supervising officer or to labor practices beyond their control, the cost does appear excessive even today.

The total bill for "repairs" was $33,788.50 with an additional $11,200.96 for sundry other bills due riggers, sailmakers, painters, the foundry, blacksmiths, etc., made the total cost approximately $45,000.00.[1]

When the secretary of the treasury became acquainted with what he termed "an enormous amount of charges" for the repair of the cutter *Washington,* he appealed on 13 May to Secretary of the Navy S. R. Mallory for the aid of an experienced naval officer to examine the situation. Apparently the Navy Department suggested the venerable Capt. Lawrence Rousseau (who had been in the navy since 1809), who was assigned to the construction and equipment of vessels at New Orleans.

Mr. Memminger wrote Captain Rousseau on 18 May asking for him to order an examination of the revenue cutter *Washington* and "ascertain the alleged necessity of the repairs which have been put upon her" and, in particular, "the reasons for the very extraordinary cost of such repairs." The captain was also asked to report on the real value of the repairs done and why the repairs made so much exceeded the original estimates. He was further asked what would have been the probable cost of the repairs had they been done under regular contracts. In general, the secretary of the treasury wanted such facts as would help make a determination of the good faith of the transaction, or whether the department would be justified in abandoning the vessel to the contractor to pay for the cost of repairs.[2]

On 19 June, Secretary Memminger wrote Navy Secretary Mallory concerning the report from a naval commissioner on *Washington* that "a great fraud has been perpetrated on the Government." The judgment of the secretary of the navy was invited as to whether it was better to take the loss of twenty-three thousand dollars in exchange for having the vessel for the use of the navy, or, if not, to abandon her altogether and allow her to be sold for the bills that remained against her.[3] The navy seems to have decided to go ahead with the cutter *Washington.*

Treasury Secretary Memminger, after reviewing the report of the survey team, also wrote to Capt. R. H. Hudgins that he understood Hudgins had been assigned "to superintend the same [the repair] from its commencement to its completion" and had been allowed three dollars per day additional compensation "to keep the time of the mechanics, and take an account of the material used in the repairs of the vessel." The secretary expressed the feeling that it appeared that Hudgins had the responsibility for the "very extraordinary expenses" and the results as given in the report of the commission. He was therefore approached with the matter before final action would be taken.[4] Hudgins's reply has not been located.

The survey team reported in July 1861, approved the work and cost, and placed an estimated value on *Washington* of thirty-five thousand dollars. If this was the cost of the ship alone, Hatch's first charge that the ship was worthless before repairs were started appears justified since the bill for repairs practically equaled her appraised value after the rebuilding. If the estimated value was for the complete ship, as appears reasonable, then the cost was excessive by ten thousand dollars.

At the time *Washington* went under repairs, she was armed with a forty-two-pounder pivot gun. This probably remained her armament after her repairs and return to service. In any event, *Washington* was again afloat with masts and spars, standing and running rigging, sails, boats, etc., by 29 April 1861. Her original dimen-

1. W-47, Cutter *Washington,* Roll 32, Microcopy 909, *Vessel Papers,* U.S. National Archives.

2. Secretary of the Treasury C. G. Memminger to Capt. L. Rousseau, CSN, Montgomery, Ala., 18 May 1861, Microcopy 500, *Letters Sent by the Confederate Secretary of the Treasury, 1861, 1864-1865,* Roll 1, 120.

3. Loc. cit., 199: Secretary of the Treasury C. G. Memminger to Secretary of the Navy S. R. Mallory, 19 June 1861.

4. Loc. cit., 357: Secretary of the Treasury C. G. Memminger to Capt. R. K. Hudgins, Richmond, 20 July 1861.

sions and lines were reported somewhat altered in the rebuilding process.

Lt. David D. Porter of the Federal navy reported in June 1861 that *Washington* was fitting out at New Orleans and was nearly ready for sea. Although she was only classed as a one-gun schooner, she was taken into the Confederate navy, but little is known of the use made of her. Strangely enough, no reference to *Washington* in the Confederate navy or revenue service records has been located, nor have any payrolls for officers or men been found.

George W. Cable, who was working in a store on Canal Street, New Orleans, commented later on *Washington*'s end:

> The old revenue-cutter *Washington*, a graceful craft, all wings [sails?], no steam, came and went from the foot of Canal. She was lying there the morning Farragut's topmasts hove in sight. . . . I stood in the rear door. . . . The junior of the firm was within. I called him to look toward the river. The masts of the cutter *Washington* were slowly tipping, declining, sinking—down she went.[5]

The Revenue Cutter *McClelland*, or *Pickens*

As affairs in New Orleans reached a breaking point in January 1861, the U.S. revenue cutter *Robert McClelland*, Capt. John G. Breshwood commanding, became the center of a brief episode that sent a patriotic thrill through the North. On 18 January 1861, just three days after he assumed the post of secretary of the treasury in President Buchanan's cabinet, John A. Dix sent the chief clerk of the first comptroller's office, W. Hemphill Jones, to the South carrying verbal orders designed to save the revenue cutters located at New Orleans, Mobile, and Galveston.

Mr. Jones telegraphed Secretary Dix on 29 January from New Orleans, "Capt. Breshwood has refused positively, in writing, to obey any instructions of the Department. In this I am sure he is sustained by the Collector, and, I believe, acts by his advice. What must I do?"

Immediately upon receiving this dispatch, Secretary Dix made the following stern reply:

> Treasury Department
> January 29, 1861
>
> Tell Lieutenant Caldwell to arrest Captain Breshwood, assume command of the cutter, and obey the order I gave through you. If Captain Breshwood, after arrest, undertakes to interfere with the command of the cutter, tell Lieutenant Caldwell to consider him as a mutineer and treat him accordingly. If anyone attempts to haul down the American flag, shoot him on the spot.
>
> John A. Dix,
> Secretary of the Treasury.

This decisive statement at a time when government officials were busy being careful with their remarks so as not to precipitate a confrontation burst upon the public scene in the North as a searchlight in the dark.

But Dix's telegram failed to hold *Robert McClelland* for the Union as Captain Breshwood surrendered the vessel to the Louisiana authorities, and Lt. Samuel B. Caldwell, instead of arresting Breshwood, joined with him in supporting the Confederacy.

On 18 February 1861, Secretary Dix performed the final act in this drama by issuing the following order of dismissal:

> John G. Breshwood, a captain in the revenue service, while in command of the revenue-cutter *Robert McClelland*, having, in violation of his official oath and of his duty to the Government, surrendered his vessel to the State of Louisiana, and S. B. Caldwell and Thomas D. Foster [Fister], lieutenants under his command, having been parties to the surrender, it is hereby directed that their names be stricken from the rolls of said service.[6]

In the Louisiana Convention on 25 March 1861, Mr. Lawrence, of Plaquemines, offered a resolution complimenting Captain Breshwood and the officers of *McClelland* for refusing to surrender the ship to the United States government. The resolution further recommended that they be retained in command of the cutter.

McClelland had been built about 1853 by J. M. Hood of Somerset, Massachusetts, and it was Revenue Marine Capt. Napoleon L. Coste who had been ordered to superintend her construction. In 1861 she was armed with five guns (four side guns and one pivot) and carried a complement of thirty-five. Captain Breshwood and Lieutenants Caldwell and Fister remained on board and were joined the end of May by John G. Blackwood, another former U.S. revenue marine officer. Fister, a Pennsylvanian by birth, had attended the U.S. Naval Academy between 1855 and 1859, but had left before graduating. *McClelland* was renamed *Pickens* and was considered as being in the Confederate revenue service.

When Revenue Marine Capt. Robert K. Hudgins

5. George W. Cable, "New Orleans Before the Capture," *Battles & Leaders* (New York: The Century Co., 1887), II, 20.

6. *Harper's Weekly*, 9 March 1861, 151:3.

refused to continue his superintendency of the rebuilding of the cutter *Washington* when she was taken over by the state of Louisiana, Captain Breshwood was ordered to replace him. This left *Pickens,* at least for a time, under the command of her next senior officer, Lt. Samuel B. Caldwell, to perform revenue duties at New Orleans.

The secretary of the treasury wrote Navy Secretary Mallory on 11 April 1861 concerning a proposal to turn over all the vessels of the revenue service to the navy.[7] Evidently the turnover took place shortly afterwards, but in this case no change was made in the management of the vessel, and the revenue service officers continued on board. Orders were sent Capt. Lawrence Rousseau, CSN, on 17 June 1861 "to fit out the cutter *Pickens.*"

There was little to do as a revenue cutter as commerce came to a halt. Only nine Union vessels entered the port of New Orleans after the declaration of war. One of these, *Ariel* of Bath, Maine (Delano, master), arrived on 25 May, attempted to escape on the 30th, but was overhauled by *Pickens* and brought back to the city. *Ariel* was condemned on 24 July and sold at the Merchants' and Auctioneers' Exchange on Royal Street to P. A. Giraud for $18,250.00. The prize money distribution took place on 1 February 1862. Seamen received $164.01 each while petty officers' shares were $311.03. Navy Capt. Lawrence Rousseau, then in command of the New Orleans Station, received $445.17. Lieutenants S. B. Caldwell and T. D. Fister each received $890.36. Captain Breshwood's name was not on the prize list, indicating he was not on board when the capture was made.[8]

Pickens operated on the lower Mississippi during 1861 and early 1862 as a part of Commodore George N. Hollins's squadron. She was downriver on 20 September 1861 when the intercession of the CSS *Ivy* may have saved her from recapture. *Ivy* was down the South Pass when she discovered the USS *Water Witch. Ivy* came out of the pass, took the cutter *Pickens* in tow and proceeded upriver. *Water Witch* came up the pass, directing a constant fire of shot and shell at the shores, presumably feeling for masked batteries. When she arrived at the telegraph station, she sent a boat ashore and took away its battery and various instruments. After a visit to the lighthouse opposite the telegraph station, *Water Witch* retreated by the same pass to sea. The steamer *Ivy,* having towed *Pickens* to safety, returned and followed *Water Witch* as far as the bar.

Just a few weeks later, *Pickens* was present in the engagement of 12 October 1861 off the Head of the Passes on the Mississippi River. Her armament at this time was reported as one 8-inch Columbiad and four 24-pounder carronades. In November 1861, Hollins reported having the two revenue cutters, *Pickens* and *Morgan,* each with three guns, in his command.

One of the seamen from the original crew of *McClelland* (or *Pickens*), a David Ritchie (probably the same as later became an officer in the Federal revenue marine service), made a statement about two months after the Federal capture of New Orleans that Confederate authorities determined to burn *Pickens* at her dock in Algiers (opposite New Orleans) rather than permit her return to Federal hands. Ritchie's story was that "the *McClelland* dropped off and her anchors let go and then was fired at about half past two in the early morning of 25 April 1862."[9] The story is plausible, and there is no record of *Pickens* after this date.

The Revenue Cutter *Lewis Cass,* or *Morgan*

The U.S. revenue cutter *Lewis Cass* was built by Page & Allen at Portsmouth, Virginia, with Revenue Marine Lt. Robert K. Hudgins being detailed on 20 June 1855 to superintend her construction. These same boatbuilders built the cutters *Phillip Allen* and *Henry Dodge* at the same time. *Lewis Cass* arrived 21 July 1860 at Mobile to replace *McClelland.*

In compliance with an ordinance from the state of Alabama and a demand by the collector of the port of Mobile, Capt. James J. Morrison, of Georgia, surrendered *Lewis Cass* to the state of Alabama on 31 January 1861, the same day that Louisiana officials seized *McClelland* and *Washington* at New Orleans. Morrison resigned his commission with the United States preparatory to resuming the command of *Lewis Cass* for the state of Alabama. She was a schooner armed with one 68-pounder gun.

Lt. Charles F. Shoemaker of *Lewis Cass* chose to remain with the North and led a party of his junior

7. Secretary of the Treasury C. G. Memminger to Secretary of the Navy S. R. Mallory, 11 April 1861, Microcopy 500, *Letters Sent by the Confederate Secretary of the Treasury, 1861, 1864-1865,* Roll 1, 42.

8. Prize List, CSS *Pickens,* 1 February 1862, P-57, Cutter *Pickens,* Roll 24, Microcopy 909, *Vessel Papers,* U.S. National Archives.

9. *The War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies* (Washington, 1880-1901), ser. I, 15, 499: statement of David Ritchie. This series cited hereafter as *O.R.*

officers and the entire crew through the South to the North. Shoemaker, who later became commandant of the U.S. Revenue Cutter Service, reported on board *Crawford* in July 1861 in time to join Flag-Officer Silas H. Stringham's naval force being assembled in Hampton Roads, Virginia. Morrison sent his resignation to Washington and acknowledged he had surrendered his vessel to the state of Alabama. Of course, it was not accepted, and Secretary of the Treasury John A. Dix dismissed him from the service on 11 February 1861.[10]

Captain Morrison needed new junior officers, and two lieutenants from *Henry Dodge* at Galveston, Texas, Lts. William G. Roche and Robert M. Rogers, were sent to Mobile, arriving in May 1861. Later, two new third lieutenants, J. T. Ledyard and Robert G. Ward, were commissioned and assigned to *Morgan* (ex-*Lewis Cass*).

With the transfer of the cutter *Lewis Cass* from the Treasury Department to the Navy Department on 28 March 1861, orders were issued on 13 April 1861 for Master Thomas B. Mills, CSN, to proceed to Mobile and assume her command. But five days later, this order was revoked, "the President having decided to retain the Revenue vessels and officers."[11] Captain Morrison was then notified by telegraph on the 22nd to resume her command under her new name of *Morgan*, changed by order of the president.[12]

About this time, Col. William J. Hardee's command of Fort Morgan at the entrance to Mobile Bay was extended to Grant's Pass and the supervision of all other approaches to the harbor of Mobile. Adj. Gen. Samuel Cooper, CSA, wrote Colonel Hardee on 17 April 1861 that if he could "advantageously" use the revenue cutter *Lewis Cass*, he was authorized to do so, and the ship would be transferred to his service by the secretary of the navy. This was done five days later on 22 April, and the cutter, renamed *Morgan*, was reported by Captain Morrison ready to leave Mobile at 2 P.M. for service with Colonel Hardee until 1 June. Morrison was advised by the secretary of the navy that "the organization of officers & crew for the Morgan will be that of a Cutter, as formerly." He was also told requisitions for pay and supplies would be sent to the Navy Department.[13]

It was apparently *Morgan*, acting under Colonel Hardee's orders, that was sent to Ship Island to land men to burn the buildings on that island on or about 23 May 1861. The New Orleans *Delta* asked the unanswered question why, but received no reply. About a month later, Maj. Gen. David E. Twiggs said in one of his reports, "As soon as I can get carriages I will mount guns on Ship Island. It was a great mistake to burn the buildings, etc., there. Not less than $100,000 worth of property was destroyed."[14]

While assigned to Fort Morgan, the cutter was used to ply among the different forts and to intercept and board vessels coming in or going out the bay. Lt. Robert M. Rogers, CSRM, later remarked that his boat's crew acted as an outpost or coast guard, and one of his activities had been to save all the government property belonging to the lighthouse on Sand Island.[15]

On 6 August 1861 *Morgan* was ordered by the then fort commander, Col. Harry Maury, to proceed to New Orleans. After arriving at New Orleans, *Morgan* was transferred back to the Navy Department by General Twiggs on 14 August. He reported to the War Department that "Commodore Hollins having assumed command of the navy in this part of the Confederacy, I have turned over to him the cutter *Morgan*, from Mobile, . . ."[16]

Commodore Hollins reported in November 1861 that his command at New Orleans included two revenue cutters, *Pickens* (ex-*Robert McClelland)* and *Morgan* (ex-*Lewis Cass*), each armed with three guns. He did not refer to *Washington* which, while at New Orleans, could have been on revenue service for the collector of the port.

The cutter *Morgan*'s final disposition has not been determined. Logic would say that she came to her end at or near New Orleans when that city was lost to the Federal navy in April 1862, but the service record of Lands-

10. Washington *Star*, Tuesday, 12 February 1861, 2:3.

11. Secretary of the Navy S. R. Mallory to Master Thomas B. Mills, CSN, Montgomery, Ala., 18 April 1861, Microcopy 625, *Area File of the Naval Records Collection, 1775-1910*, Roll 411, *Area 6 File*, frame 9.

12. *O.R.* 52, pt. 2, 61. Also Memphis *Daily Appeal*, Saturday, 27 April 1861, 2:6, quoting the Mobile *Tribune*.

13. M-57-8, Cutter *Morgan*, Roll 21, Microcopy 909, *Vessel Papers*, U.S. National Archives.

14. *Official Records of the Union and Confederate Navies in the War of the Rebellion* (Washington, 1894-1922), 16, 827: report of Major General Twiggs, CSA, HQ, Dept. No. 1, C. S. Army, New Orleans, La., 25 June 1861. This source cited hereafter as *N.O.R.*

15. Capt. of Arty. R. M. Rogers to Maj. Walter Jones, comd'g., Montgomery, Ala., 15 August 1864, Personal papers of R. M. Rogers, Roll 7, Microcopy 260, *Confederate Naval and Marine Personnel: Reference Cards and Papers*.

16. *O.R.* 53, 727.

man W. P. Billingsly suggests otherwise. His file contains the notation, "Muster roll of recruits on board of the C. S. Receiving Ship 'Danube' [at Mobile] Apl 1 to 30 June '64 shows W. P. Billingsly Landsman enlisted Apl 17/64 Mobile, Ala. Assigned to the 'Morgan' List of the Revenue Cutter 'Morgan' dated Apl. 27/64."[17]

This brief notation indicates the cutter *Morgan*, still in the revenue service, escaped the disaster at New Orleans in April 1862, and made it back to Mobile where she was still on duty in April 1864. Captain Morrison was paid on the Mobile Station from April 1864 through 31 January 1865, but he said after the war that he was "entirely out of service" after the fall of New Orleans. Perhaps the command had passed to a younger man.

The Revenue Cutter *Henry Dodge*

The U.S. revenue cutter *Henry Dodge* was at Galveston, Texas, early in 1861 when her experienced captain, sixty-eight-year-old Levy Charles Harby, resigned from the U.S. service. Succeeding Harby was his first lieutenant, William F. Rogers, of Virginia, whose promotion to captain was received on the morning of 2 March 1861. On this very day, Rogers, accompanied by Lt. W. G. Roche, walked to the customhouse in Galveston to surrender their ship in conformity to the demands of the Texas Convention. Both Rogers and Roche tendered their services to the new government, and they were accepted. Third Lt. Robert M. Rogers, a younger brother of William F., also went with the Confederacy. Navy Commander William W. Hunter later said that Lt. William F. Rogers was "mainly instrumental in placing her [*Henry Dodge*] in the possession of the Confederate Government."

Dodge, as she was customarily called, was a sister ship of the cutters *Phillip Allen* and *Lewis Cass*, all having been built by Page and Allen, of Portsmouth, Virginia, in 1853. One report says she was one hundred tons and carried one long pivot gun, a nine-pounder. She was built especially for service on shoal waters and had a centerboard. Her normal complement was reckoned as twenty-six officers and men.

Commander Hunter was sent to Texas in the summer of 1861 to be in charge of the naval defenses of Galveston where he made *Henry Dodge* his flagship. Indeed, she was, in effect, his entire squadron in the beginning.

17. Carded record for W. P. Billingsly in Microcopy 260, *Confederate Naval and Marine Personnel: Reference Cards and Papers*, Roll 5.

The army command in Texas started pushing for the replacement of *Henry Dodge* by the steamboat *Bayou City*, and even sent orders on 20 October 1862 to Hunter to arm *Bayou City* and to man her with the crew of the cutter *Dodge*. A few days later, Army Quartermaster 1st Lt. Thomas Gonzalez was ordered to receive all ordnance and ordnance stores from Hunter or Lieutenant Rogers. These were to be transferred to Capt. Henry S. Lubbock, commanding *Bayou City*, for use on that vessel or on board the schooner *Royal Yacht*. The crew of *Dodge* was also ordered on 26 October 1862 to report to Lubbock for assignment to duty.

Commodore Hunter began to strip *Dodge*, and various items such as nautical instruments, accounts, anchors, etc., were removed in five wagons to Col. Hamilton Washington's plantation on the Trinity River, Polk County, Texas. By this time, *Dodge* had become so worm-eaten as to require regular pumping. The number of navy personnel was small, and Hunter transferred only twelve men to Captain Lubbock. *Henry Dodge* was turned over to the army on 17 December 1862.

Hunter received orders from the Navy Department in April 1863 to transfer such enlisted men of the naval service still under his command to Lt. Joseph N. Barney, CSN, for service on board CSS *Harriet Lane*, captured from the Federal navy on 1 January 1863. Hunter had but a few men, and Barney received just six: a boatswain, a carpenter's mate, and four seamen from Capt. William F. Rogers who accompanied them.

This transfer did not last for long as Barney was soon ordered to transfer his "Navy proper" men to Shreveport, Louisiana, to report to Lt. Jonathan H. Carter, CSN, commanding CSS *Missouri*, an ironclad launched on 14 April 1863.

Henry Dodge had one last adventure in her worm-eaten timbers. A Col. Valery Sulakowski proposed sending her through the blockade to Havana with a load of cotton to be sold to obtain funds for purchasing a steamer.[18] In an attempt to carry out this plan, *Dodge* was reconditioned for sailing and renamed *Mary Sorley* of Galveston. (James Sorley was the collector of customs at Galveston.) She was loaded with 257 bales of cotton and took off for Havana with a crew of eight (including Charles Diericks, master) and two passengers.

18. *O.R.* 26, pt. 2, 449; Gen. J. B. Magruder to Brig. Gen. W. R. Boggs, Houston, 27 November 1863.

She didn't make it. The Federal blockaders sighted her off Galveston shortly before midnight on 3 April 1864, and she was captured about 2 A.M. by the U.S. gunboat *Sciota,* Lieutenant Commanding George W. Perkins. She was taken to New Orleans after capture for adjudication as a prize. She was sold promptly for $103,083.46 and, after expenses were deducted, $97,791.28 was turned over to the fourth auditor of the treasury on 28 July 1864 for distribution to the crew of *Sciota.*[19] Her ultimate fate is not known.

The Revenue Cutter *William Aiken*

The *William Aiken,* formerly the pilot boat *Eclipse* at Charleston, South Carolina, was purchased for revenue marine service for forty-five hundred dollars in 1853. She was an eighty-ton ship with a crew of ten to fifteen officers and men. Her log shows that at 4 P.M. on Thursday, 27 December 1860, her colors were hauled down by order of her captain, Napoleon L. Coste, and her crew discharged, the vessel having been turned over to the state of South Carolina by Collector William F. Colcock.

One of *William Aiken*'s officers, 1st Lt. John A. Underwood, gave the press in the North his story of the events leading to her surrender. Several weeks before the ordinance of secession in South Carolina, Captain Coste told Underwood that he would not serve under Lincoln, and, if South Carolina seceeded, he (Coste) would resign and turn the command of the vessel over to Underwood. Underwood then consulted with his brother officer, 2nd Lt. Henry O. Porter, as to the proper course to pursue. Various adverse factors directed against sailing the vessel to the North, and a tentative decision was made to place her under the protection of Fort Moultrie. Major Anderson approved of this possible action.

On 27 December 1860, Lieutenant Underwood went on shore, leaving Captain Coste and Lieutenant Porter on board. During the afternoon, Captain Coste called on Underwood and informed him that he had paid off the officers and crew up to the 26th of December, and that the Palmetto State flag had been hoisted. Under the circumstances, there was nothing Underwood could do to recover control of the vessel so he left Charleston and proceeded to Washington where he reported the facts to the Treasury Department.[20] Underwood further reported that "the crew, on being notified of the position of Captain Coste, . . . promptly volunteered to remain under his command as an officer of South Carolina. . . ."

Captain Coste remained in command of *William Aiken* as she entered into the guard service and harbor police force of the state. Henry A. Mullings was employed as second lieutenant on 29 December; P. Augustus Auerilhe, Jr., was employed as a second lieutenant on 31 December; and N. E. Coste (a son of the captain?) was employed as a third lieutenant on 14 January 1861. Her crew was hired by the month with a nucleus shipping over regularly. At this time the ship was armed with one brass twelve-pounder howitzer, working amidships, and carried a number of Maynard rifles.

Beginning on 28 January 1861, *William Aiken* was first mentioned as a "Coast Police Cutter." This designation was changed on 4 March 1861, when she was first mentioned as the "C.S.A. Cutter William Aiken." The last entry in her log is dated 21 April 1861. Then, for a few weeks, she was loaned to the Marine School of Charleston as a schoolship in place of the unseaworthy brig *Lodebar.*

Aiken, as she was referred to customarily, was sold by the state of South Carolina to become a privateer. She was commissioned on 10 July 1861 for her new venture as *Petral* of Charleston, South Carolina, Master William Perry. She was registered by ten owners, residents of Charleston, as an eighty-two-ton vessel armed with two guns and having a crew of thirty-five. She had a short life as a privateer as she ran afoul of USS *St. Lawrence* (a fifty-gun frigate) and was sunk in a brief and unequal engagement on 28 July 1861.[21] Two of her crew were drowned, but thirty-six were picked up by *St. Lawrence* and were sent to jail in the North where they were confined for some months. The crew was threatened with charges of piracy but ultimately the survivors who did not renounce their allegiance to the South were paroled or exchanged.[22]

19. *Annual Report of the* [U.S.] *Secretary of the Navy* dated December 1865, 478 and 512.

20. Statement of Lieutenant Underwood, *New York Times,* Wednesday, 9 January 1861, 1:3. Essentially the same story is in *Harper's Weekly,* Saturday, 12 January 1861, 22:4.

21. *N.O.R.* I, 818.

22. II *N.O.R.* 2, 293-294; II *O.R.* 3, passim; II *O.R.* 4, 281-83.

The Revenue Cutter *Ewing*, or *Bradford*

A small steamer known as *Ewing* was serving as a U.S. revenue marine cutter in Florida waters when taken over by the Confederate government and armed for its service. She was renamed *Bradford*.

Maj. Gen. Braxton Bragg at Mobile wrote Brig. Gen. Sam Jones at Pensacola on 12 February 1862 suggesting he withdraw all forces except two companies from Deer Point and keep his largest gunboat, *Bradford*, stationed nearby to bring off those troops in case of a heavy attack. The next day, Bragg ordered Lt. Robert M. Rogers, CSRM, to report to General Jones for duty with the gunboats, presumably those under construction at the head of Pensacola Bay, one by F. G. Howard, and the other by Ollinger & Bruce.

The impending evacuation of Pensacola led General Jones to order Lieutenant Rogers to Mobile on 6 March to procure an experienced pilot and make the necessary arrangements for taking the gunboat *Bradford* from Pensacola to Mobile. Two days later, Jones wrote Capt. Thomas W. Brent, CSN, that an attempt might be made to run *Bradford* and *Nelms* (another small steam gunboat) into Mobile Bay. He suggested that it might be possible for these two gunboats to tow into Mobile Bay on a dark night the two gunboats under construction at or near Milton, Florida.

It is possible that *Bradford* escaped to Mobile although the two gunboats on the stocks were destroyed on 11 March 1862 to prevent their falling into the hands of the Federals. A payroll for twelve crew members of *Bradford* for April 1862 still exists.

The wreckage of *Bradford*, referred to again as *Ewing*, was auctioned off as a wrecked steamer abandoned by the Confederate navy around November 1865.[23]

The Lighthouse Tender *Alert*

The lighthouse tender *Alert* was seized at Mobile on 18 January 1861 at the same time as the revenue cutter *Lewis Cass*. Although she was but a small schooner, she was armed with a thirty-two-pounder gun and did service in Mobile Bay until sold in the spring of 1863. As late as May 1861 she was still serving as a lighthouse tender under the command of John F. Banifer with a small crew of eight: one mate, five seamen, a cook, and a cabin boy.[24]

The secretary of the treasury, C. G. Memminger, contacted the Navy Department as to its wishes concerning *Alert*, and, in accordance with Secretary Mallory's request, ordered on 8 October 1861 that *Alert* be turned over to the orders of the Navy Department. Memminger suggested to Thomas E. Martin, acting chief of the Light House Bureau, "You had better add a condition that she should be returned in good order to the light-house bureau whenever required for that service." Secretary Mallory was very brief in his letter of the same date, "if you will turn the vessel mentioned in your note over to this Department, I will place her under the command of a naval officer, arm and equip him, and use her for service in Mobile Bay."[25]

When the navy took her over must have been the occasion of her being armed with the thirty-two-pounder. A new commanding officer, Adolphus N. Pacetty, was sent on board. He was rated as acting master's mate from 19 October through 4 November, and as acting master from 5 November 1861 through 31 March 1863. The navy's complement for *Alert* was about thirty officers and men. Thus, for a time, *Alert* became an integral vessel of such a squadron as the navy could assemble at Mobile early in the war.

Alert apparently served on routine harbor police duty at Mobile, but J. M. Withers complained to Gen. C. J. McRae that "the trade with New Orleans through the sound could be kept open and safe. It is not now, and, in my judgment, never will be under the present management." He placed the blame on all the naval officers "from Lieutenant [James D.] Johnston on down, whom he would not feed for their services."

In late December 1861, a small blockade runner from Havana beached under the guns of Fort Morgan, and Gen. Braxton Bragg complained that *Florida* (later renamed *Selma*) lay at her moorings instead of assisting the blockade runner. He further complained that "an armed schooner [presumably *Alert*] is also lying in the harbor here utterly useless. It would be economy to give her away and discharge the crew."

23. *N.O.R.* 22, 257.

24. Entry 419, *Muster Rolls and Pay Rolls of Vessels of the C.S. Navy*, "Pay Roll of crew of Light House Tender 'Alert' during the Month of May 1861," Record Group 45, U.S. National Archives.

25. Secretary of the Navy S. R. Mallory to Secretary of the Treasury C. G. Memminger, Richmond, Va., 8 October 1861, Microcopy 625, *Area File of the Naval Records Collection, 1775-1910*, Roll 412, *Area 7 File*, frame 294.

The complaints reached Secretary Mallory through channels, and he took some of the fire out of Bragg's complaints by pointing out that *Florida* was at the city, thirty miles away, when the incident took place. As to the complaint about *Alert,* Mallory pointed out she was but a small sailing schooner armed with but one gun, and that while he had confidence she would have sailed against the Federal ships pursuing the blockade runner could she have rendered any service, he would call upon her commanding officer to explain his apparent neglect of duty. The explanation must have been satisfactory as Acting Master Pacetty was retained in his command.

It was not until February 1862 that the steam sloops *Morgan* and *Gaines* were launched at Mobile, soon relegating *Alert* to a secondary role in the Mobile Squadron.

Alert was sold early in 1863, and Navy Paymaster Ware posted forty-eight thousand dollars on his books 21 March representing the proceeds. Effective 31 March 1863, the remaining eighteen seamen, landsmen, and a boy were transferred to CSS *Tuscaloosa.*[26] Master Pacetty was soon assigned to duty with a floating battery at Mobile.

The Lighthouse Tender *Minot,* or *Manassas*

Minot, a sixty-ton schooner, belonged to the Federal lighthouse service at the outbreak of the war. She had been originally employed in Minot's Ledge Lighthouse (near Boston) work until September 1858 when she was transferred South.[27]

She was probably taken over by North Carolinians, possibly at New Bern, in the spring of 1861. There is a record showing that Capt. Thomas Sparrow, commanding the North Carolina forces at Ocracoke Inlet in the Outer Banks, received permission on 23 July 1861 from the North Carolina Military and Naval Board to make use of *Minot* after obtaining her from the quartermaster.[28]

A month later, on 27 August 1861, Flag-Officer Samuel Barron, CSN, seized her at New Bern, North Carolina, changed her name to *Manassas,* and ordered Lt. William H. Murdaugh, CSN, to her command as well as that of two launches, *Mosquito* and *Sand Fly.* Barron established himself on board *Manassas,* making her temporarily the flagship of his tiny squadron.[29] Murdaugh never assumed command as he was seriously wounded the next day in the Federal attack on Fort Hattaras.

Flag-Officer William F. Lynch, Barron's successor, wrote on 17 September 1861 from the "Flagship Manassas" off Roanoke Island, and there are mentions of her on duty in entries dated 27 December 1861 and 5 February 1862 in the log of CSS *Ellis.* Available information indicates she was dismantled by the Confederates themselves, probably in the spring of 1862.

Ralph W. Donnelly became a reference historian for the United States Marine Corps after a career in life insurance administration. After retiring in 1975, he continued independent research; Donnelly authored The History of the Confederate States Marine Corps, *published in three parts, co-authored (with Henry I. Shaw, Jr.)* Blacks in the Marine Corps, *and published articles in numerous journals. Donnelly is also a member of the Southern Historical Association, the Council on America's Military Past, the Company of Military Historians, and the North Carolina Historical Commission.*

26. Entry 419, *Muster Rolls and Pay Rolls of Vessels of the C.S. Navy,* "Transfer A/C of 18 Sea. Or. Sea. & Boy from Schr. *Alert* to C.S.S. *Tuscaloosa* Mch 31/63," Record Group 45, U.S. National Archives.

27. *Tenders and Light Vessels,* 103. This is a handwritten volume created by the U.S. Lighthouse Service and on file in the Historical Library of the Public Information Division, HQ, USCG, Washington, D.C. Information furnished by Truman Strobridge, one-time historian, USCG. For her seizure, etc., see I *N.O.R.* 6, 718: Flag-Officer S. Barron, CSN, to secretary of the navy, 27 August 1861.

28. AG 17, [N.C.] *Military Board Letter Book, 1861, July 1-Aug. 19,* p. 79. MS. volume in N.C. State Archives.

29. *N.O.R.* 6, 718.

The Northern Theater in the Civil War

The USS *Michigan* and Confederate Intrigue on the Great Lakes

BRADLEY A. RODGERS

FEW people are aware of how dramatically the Civil War affected the supposed noncombatant areas of the country. One of the most significant of these areas was the Great Lakes region. Only one U.S. Navy warship patrolled this region, the USS *Michigan*. Throughout the war this vessel aided the Union war effort recruiting men for the navy, quelling draft riots in the port cities, and putting a stop to the potentially bloody strikes in Houghton and Marquette, Michigan. The importance of the *Michigan* during the war was underscored by several Confederate attempts to capture or destroy her.

Built in 1843, the 582-ton sidewheel steamer USS *Michigan* was the United States Navy's first iron-hulled warship. She was also the first U.S. Navy ship to use steam as her primary power source. The *Michigan* was launched at Erie, Pennsylvania, on Lake Erie in order to redress the balance of power between Great Britain and the United States in that region.[1] Although she was limited in armament to one gun by the Rush-Bagot Agreement with Britain, her size, speed, and gun-carrying potential gave her the powerful navy designation, first class steamer of war.[2]

The effects of the Civil War were slow in coming to the northern lakes. Hence, in March 1861, the U.S. Navy steamship *Michigan* prepared to resume her annual routine cruises to various ports on the lakes. Captain and crew alike were unaware that the clouds of war gathering to the south could reach their vessel and disrupt the springtime calm of the Great Lakes. However, on 9 May 1861, the USS *Michigan* was instructed to proceed to various large city ports on the lakes for the purpose of enlisting men into the United States Navy.[3] During the course of the Civil War, the *Michigan* recruited over four thousand men from the Great Lakes region to serve in the Union navy. Most of these recruits served with Adm. David D. Porter's Mississippi Squadron.[4]

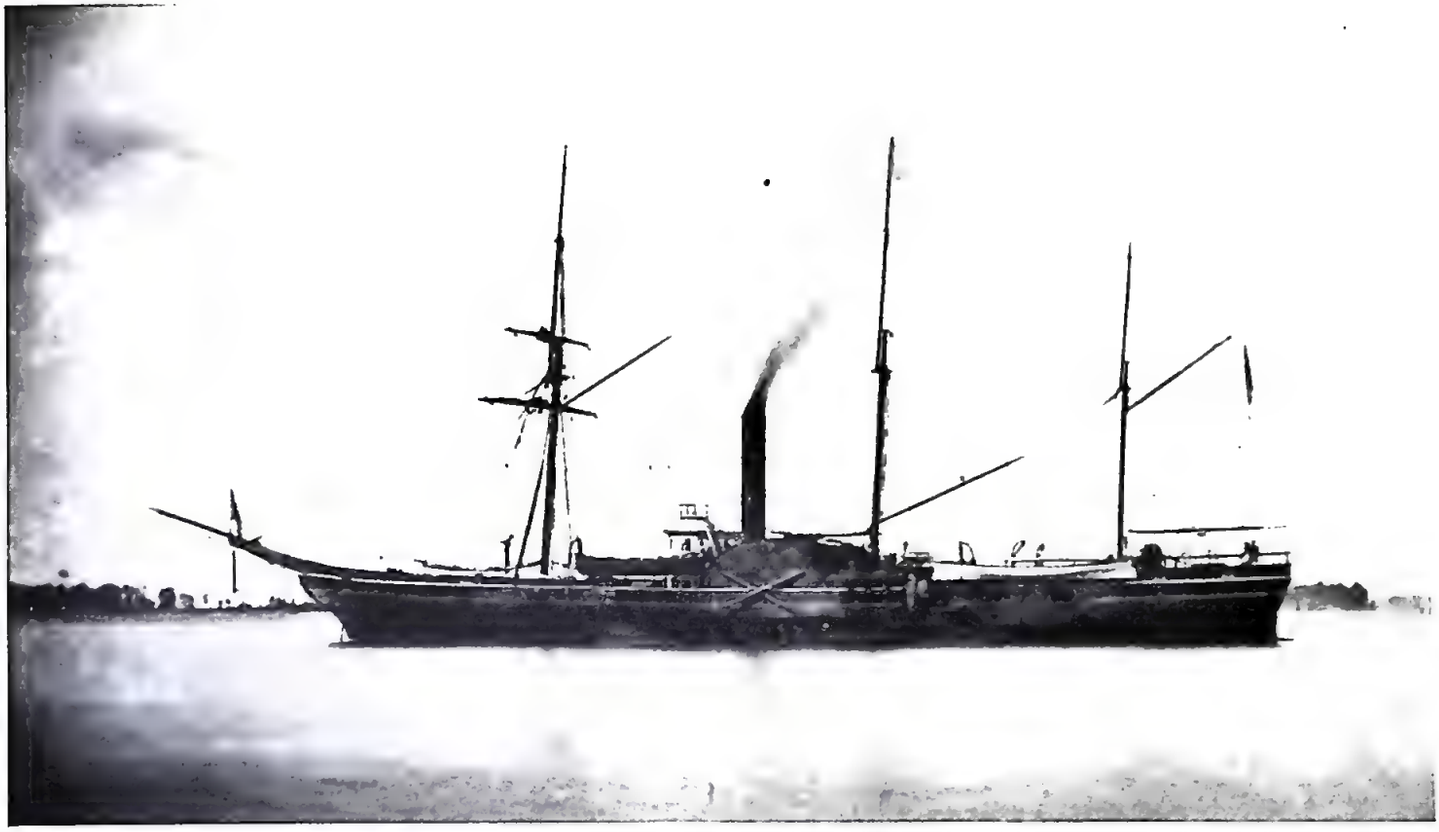
The *Michigan*'s wartime routine of visiting lake cities for recruitment purposes continued throughout 1862. In 1863, however, the *Michigan* began to help municipal authorities cope with the civil disorder brought about by the war. By this time the federal government realized that the war was becoming unpopular but was likely to continue for quite some time. Federal mandatory conscription laws were passed on 3 March 1863. Before this time, state and local conscription had been used to fill in

1. Details concerning Anglo-American relations and diplomacy on the Great Lakes after the War of 1812 can be found in John W. Foster's report, *Limitation of Armament on the Great Lakes* (Washington, 1914) and *Senate Executive Document No. 9*, 52nd Cong., 2nd Sess., 1, 7 December 1892, ss-3055 reprinted as *House Document No. 474*, 56 Cong., 1 Sess., 27 February 1900, ss-3988. Secondary works on the subject include Kenneth Bourne's *Britain and the Balance of Power in North America*, Richard Preston's *The Defence of the Undefended Border: Planning for War in North America*, Robin Winks, *Canada and the United States: The Civil War Years*, and James M. Callahan, "The Neutrality of the American Lakes and Anglo-American Relations," *Anglo-American Relations & Southern History*.

2. George F. Emmons, *The Navy of the United States, 1775-1853* (Washington, 1853), p. 31. Kenneth Bourne, in *Britain and the Balance of Power in North America*, p. 154, and Robin Winks in *Canada and the United States: The Civil War Years*, p. 56, state that had the *Michigan* been able to negotiate the Welland Canal she would have become a welcome addition to one of the Union Navy's Atlantic blockading squadrons.

3. Navy Department to Commander Carter, 9 May 1861, *Official Records of the Union and Confederate Navies in the War of the Rebellion*, ser. 1, vol. 2 (Washington, 1895), 414. Hereafter cited as *ORN*.

4. Rear Adm. David D. Porter's testimony, John C. Carter Papers, file no. VMF 1227, 16, Ohio Historical Society. Hereafter cited as John C. Carter Papers.



This photograph, taken on 17 September 1868, shows the USS *Michigan*, the U.S. Navy's first iron-hulled warship. Courtesy of George R. Babcock, from the collection of his father, Surgeon H. P. Babcock, USN, and the U.S. Naval Historical Center.

the gaps in the army left by casualties and falling numbers of volunteers. Unfair clauses in these laws, which seemed to pander to the rich, caused much anxiety and consternation in the North. For those that did not want to serve in the army, fear, anger, and civil unrest were the consequences of the draft.

On 28 July 1863 the *Michigan*'s commanding officer John C. Carter reported,

> The visit of this ship to Detroit, Michigan, at this time was opportune. I found the people suffering under serious apprehensions of a riot in consequence of excitement in reference to the draft, probably brought about by unscrupulous sensational newspapers predicting such riots. The presence of the ship perhaps did something toward overawing the refractory, and certainly did much to allay the apprehensions of an excited, doubting people. All fears in reference to the riot had subsided before I left.[5]

By the end of August the *Michigan* was ordered to help suppress riots in Buffalo, New York, and Milwaukee, Wisconsin.[6] Reporting on the *Michigan*'s actions in Buffalo, Commander Carter related,

> I was called to Buffalo, New York, by urgent information that great danger was apprehended when the draft was to take place; that there was an organization of some 7000 ruffians determined to fire and destroy all the elevators, containing millions of bushels of grain, in the vicinity of the creek. I proceeded immediate to that place and put my ship in the best possible position to act in case of necessity.[7]

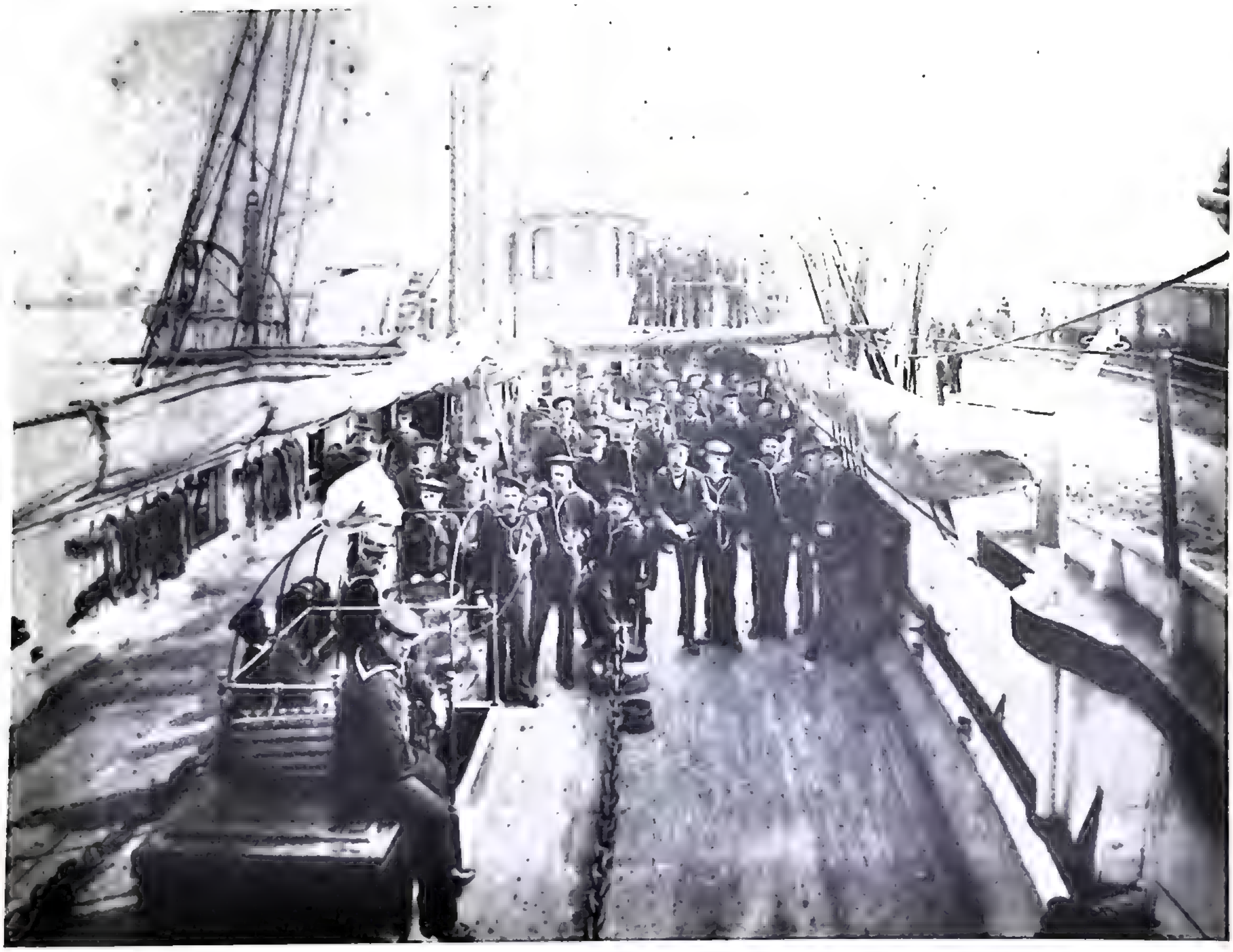
Four days after Carter's report the navy increased the *Michigan*'s armament in the form of two 12-pounder howitzers plus shrapnel and grapeshot ammunition. These howitzers were equipped with boat carriages and field carriages. Carter had these guns mounted on the forecastle and promenade deck in order to be as visible as possible.[8]

5. Report of Commander Carter to the Navy Department, 28 July 1863, *ORN*, ser. 1, vol. 2, 415.

6. Paper 1, written testimony, John C. Carter Papers.

7. Report of Commander Carter to the Navy Department, 3 September 1863, *ORN*, ser. 1, vol. 2, 435.

8. Rough Logbook, USS *Michigan*, RG-24, National Archives, Washington, D.C., Log entry, 7 September 1863, Rough Log, 8 Decem-



The crew of the USS *Michigan* at ease sometime during the 1860s or 1870s. Courtesy of the Reedee Collection, Mariners' Museum, Newport News, Virginia.

On 22 October 1863 the *Michigan* was ordered to proceed to Sandusky, Ohio.[9] A federal prisoner-of-war camp had been established on Johnson's Island in Sandusky Bay. The *Michigan* was ordered to cooperate with the army in guarding the Confederate prisoners incarcerated there. While the sailors of the *Michigan* drilled with the new guns the marines performed guard duty on the island itself.[10]

In November of the same year, with winter closing in, Secretary of War Edwin M. Stanton gave an ominous warning to the mayors of the cities located on the Great Lakes. Stanton warned that the Confederacy intended to carry the war to the heart of the North in the form of ship-borne raids from the provinces of Canada.[11] At almost the same time the Navy Department informed Commander Carter that, "Reliable information is furnished this Department that a project is on foot in Canada to fit out steamers and attempt a rescue of the prisoners confined on Johnson's Island. . . . Rifled guns will be sent to you."[12] These guns arrived only eleven days later. In total the *Michigan* received a dozen naval

ber 1862-23 July 1864. Hereafter logbook entries will be cited according to log entry date followed by the dates covered in the logbook.

9. Commander Carter to Navy Department, 28 October 1863, *ORN*, ser. 1, vol. 2, 478-79.

10. Logbook entry, 26 October 1863, Rough Log, 8 December 1862-23 July 1864.

11. Letter of Lieutenant Minor, CSN, to Admiral Buchanan, CSN, 2 February 1864, *ORN*, ser. 1, vol. 2, 826.

12. Navy Department Dispatch, 12 November 1863, *ORN*, ser. 1, vol. 2, 496.

cannon to augment the two howitzers and one 8-inch pivot already carried on the vessel.[13]

The oracular warnings by Stanton and the Navy Department concerned a plan formulated in the Confederacy which, if successful, would have grave consequences for the *Michigan* and the Union. By fall 1863, with no end in sight to the war and the defeat at Gettysburg still fresh in memory, the Confederate high command desperately searched for a way to weaken the Union. Some Confederate leaders believed that a blow struck directly at the relatively unassailable cities in the North by raiders operating out of Canada might be the key to the collapse of Union morale.[14] Also, excitement over incidents such as the *Trent* affair and the blockade of southern ports had strained Anglo-American relations to the breaking point. The Confederates, therefore, may have been looking for a way to foment trouble between the two countries. War between Britain and the United States would certainly relieve some of the military pressure being placed on the South.

Earlier in 1863, Lt. William H. Murdaugh, CSN, submitted a plan which the Confederate high command believed had promise for success at that time. Central to the plan was the capture or destruction of the USS *Michigan* by Confederate-manned steamers operating out of unspecified ports in Canada. If the *Michigan* could be captured she would be used to release the thousands of Confederate prisoners confined on Johnson's Island, serve as a Confederate raider to disrupt shipping, and finally shell the lake port cities into submission.[15] Since the *Michigan* was the only warship on the upper lakes, the successful execution of the plan would have devastating effects on the North.[16]

Confederate Secretary of the Navy Stephen R. Mallory approved the plan and twenty-five thousand dollars was allocated along with a makeshift crew of sailors and officers from the scuttled and burned CSS *Virginia*, formerly the USS *Merrimack*.[17] Before the raiders could leave for Canada, however, Confederate president Jefferson Davis vetoed the plan. Looking at the possible political consequences of the attack, Davis postulated that the creation of an unfortunate political atmosphere between Britain and the Confederacy may result in the discontinuation of work on a Confederate armored cruiser then being built in Britain.[18]

By the fall of 1863, however, the deteriorating strategic situation faced by the South caused the reexamination and grudging acceptance of desperate measures to help win the war. Confederate Secretary of War James A. Seddon and Naval Secretary Mallory called in CSN Lt. Robert D. Minor to review the Murdaugh plan. Minor carefully documented this plan and gave the details to the secretaries.[19]

The Murdaugh plan was approved for the second time in September 1863 and appropriations were made for the operation. At this stage of the war the plan was considerably more expensive than the first attempt would have been. Funding amounted to thirty-five thousand dollars in gold supplemented by the profits from a cargo of cotton that the Confederate agents sold in Britain for seventy-six thousand dollars. The expedition of twenty-two men under command of Lt. John Wilkinson left Smithville, North Carolina, on 7 October 1863. They traveled to Nova Scotia on board the blockade runner *Robert E. Lee* and from there split up to make their way individually to Montreal to meet on an agreed-upon date of 21 October.[20]

In Montreal the Confederate agents were able to purchase one hundred colt revolvers and two 9-pound cannon. The would-be raiders, in a seemingly naive attempt to allay the suspicion of the local authorities, bought dumbbells as ammunition for the cannon rather than shot. Volunteers were sought among approximately 180 Confederate escapees contacted in Montreal but only 32 agreed to participate in the expedition. The entire Confederate force amounted to 54 men.[21]

While the Confederate rescue force in Canada was arming and organizing, the prisoners on Johnson's Island were notified of the rescue attempt in advance.

13. Log entry, 23 November 1863, Rough Log, 8 December 1862-23 July 1864.

14. Lieutenant Minor CSN, to Admiral Buchanan CSN, 2 February 1864, *ORN*, ser. 1, vol. 2, 823.

15. Lt. William Murdaugh's plan, 7 February 1863, *ORN*, ser. 1, vol. 2, 828.

16. At this time there were no British patrol vessels or warships on the lakes to thwart Confederate threats to Canadian neutrality. Canada did possess small vessels used for pilotage which later may have been armed for patrol purposes. Robin W. Winks, *Canada and the United States: The Civil War Years* (Baltimore, 1960), p. 55. Hereafter cited as Winks, *Canada and the United States.*

17. Lieutenant Minor, CSN, to Admiral Buchanan, CSN, 2 February 1864, *ORN*, ser. 1, vol. 2, 823.

18. Ibid.

19. Ibid.

20. Ibid., 824.

21. Ibid.

The Confederate agents in Montreal had a contact in Baltimore who put their messages in the *New York Herald* personal columns. The prisoners on Johnson's Island apparently had access to the newspaper and were aware of the coded messages.[22]

The next step in the plan involved commandeering a steamer bound for Chicago from St. Catherines, Canada. The steamer would then be taken into Sandusky Bay at dawn and made to "accidentally" run into the *Michigan*. The warship would be boarded and as a signal to the prisoners on the island that the vessel was in Confederate hands, a cannon shot was to be fired through the Union officers' quarters on the island.[23]

By November 1863, the Confederate plans had advanced to the stage of buying passage on a steamer bound for Chicago when Canadian governor General Lord Monck warned the United States government of the plot.[24] Apparently the Confederate agents were not as unobtrusive in Montreal as they had hoped to be. The Canadian government, concerned about the threat to its neutrality, felt obligated to report the Confederate activity. With the plan revealed and the *Michigan* alerted by the Navy Department, the Confederate raiders abandoned the rescue attempt and made their way back to the southern states.[25]

The possibility of Confederate intrigue set an ominous tone for the 1864 cruising season on the lakes but the *Michigan*'s spring and summer cruises were routine. The only danger the crew of the ship seemingly faced was the dilapidated condition of their own vessel. Except for a boiler replacement in 1861 the *Michigan* had sailed for twenty years without major repairs or an overhaul and she was beginning to show her age. Commander F. A. Roe, who relieved Carter as commander of the vessel towards the end of 1864 reported, "Every bit of wood-work in her was rotten, and it was not known when the vibrations of the steam engines would shake yards and masts all together in a mass on deck. . . . Her decks leaked like a sieve."[26] The *Michigan*, however,

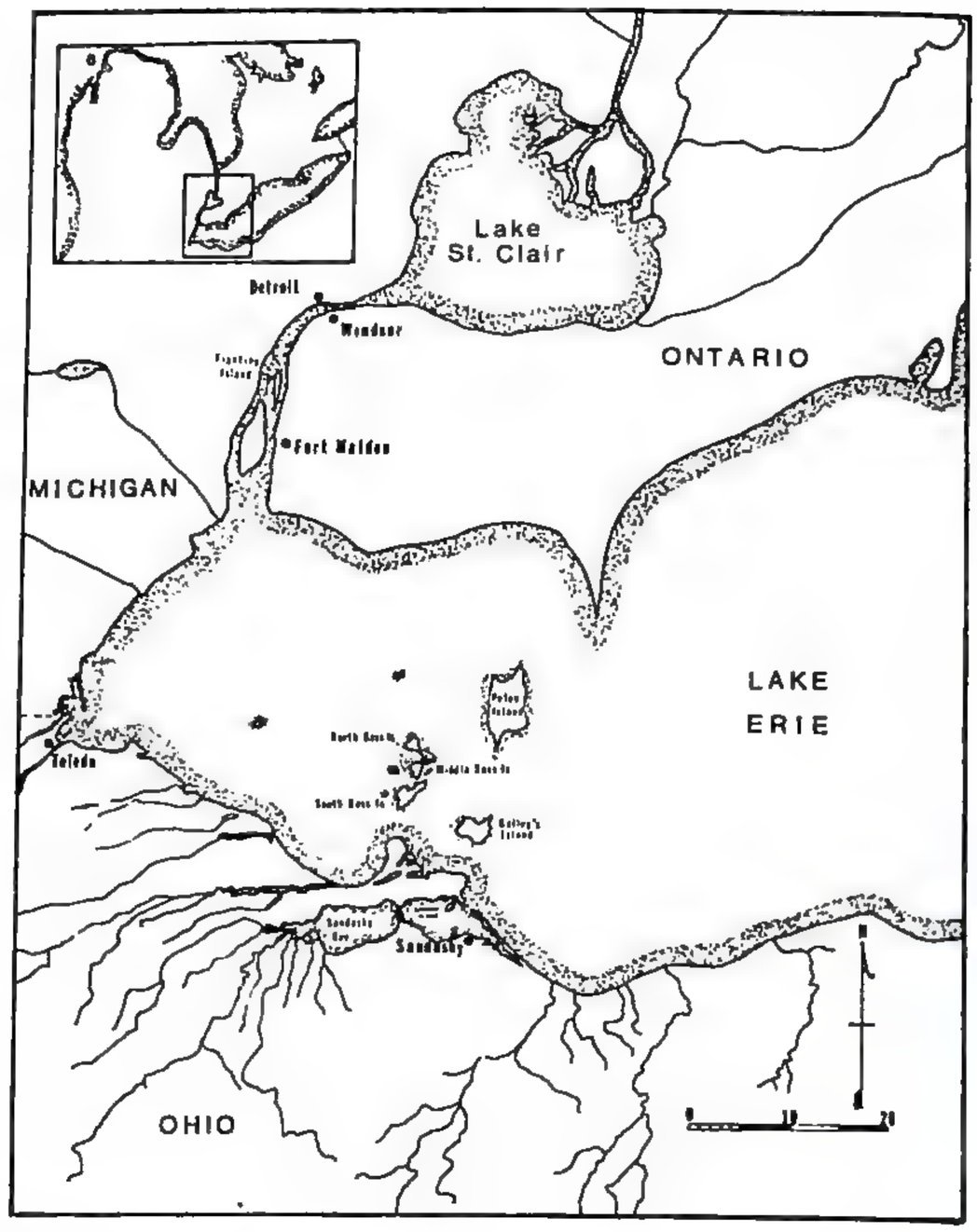


Illustration by the author.

would not be overhauled for another year.[27] During war, details like keeping nonessentials replaced and the comfort of the crew became secondary to the maintenance of the guns and steam machinery.

Despite the *Michigan*'s respite from possible attack in the spring and summer of 1864, the ghost of the Murdaugh plan would not die. Jacob Thompson, former secretary of the interior, was during the war a Confederate agent operating out of Canada. Thompson had funded several projects to demoralize the union including public peace rallies in Peoria, Chicago, and Springfield, Illinois. Confederate money to carry out these activities was donated to the Sons of Liberty, an organization of Northerners opposed to the continuation of the war.[28] Not entirely satisfied with funding peace rallies, Thompson was on the alert for a more direct approach to undermine the morale of the northern cities. To this

22. Ibid., 825.

23. Ibid., 826.

24. Ibid.

25. Navy Department Dispatch, 12 November 1863, *ORN*, ser. 1, vol. 2, 496.

26. F. A. Roe, "The United States Steamer *Michigan* and the Lake Frontier During the War of the Rebellion," *The United Service, A Monthly Review of Military Affairs* 6 (December 1891), 545. Hereafter cited as Roe, "Lake Frontier During the War of the Rebellion."

27. Commander F. A. Roe to Navy Department, 13 September 1865, *ORN*, ser. 1, vol. 3, 590-91.

28. Report of Confederate States Agent Jacob Thompson to J. P. Benjamin, secretary of state, 3 December 1864, *ORN*, ser. 1, vol. 3, 714. Hereafter cited as Thompson's Report.

effect, he persuaded Confederate captain Charles H. Cole, who had recently escaped from a Union prisoner-of-war camp, to examine the possibility of capturing or destroying the *Michigan* in Sandusky Bay.[29]

Cole, evidently familiar with the Murdaugh plan, presented a similar proposal. Unlike the previous plan, Cole's plot called for participation in the takeover by an inside man. Cole was to go to Sandusky, Ohio, and assume the role of a businessman. He would then attempt to ingratiate himself with the officers of the *Michigan*. According to the Confederate timetable the takeover attempt would occur on 19 September 1864. On that date Cole would go on board the vessel and attempt to incapacitate the ship's officers by getting them drunk. In the meantime a party of Confederates under the command of Acting Master John Y. Beall, having commandeered a steam vessel out of Detroit and having received a go-ahead for the plan via a messenger sent by Cole, would board the *Michigan* and subdue the crew. As with the Murdaugh plan a cannon shot fired through the Union officers' quarters would signal the Confederate prisoners that the *Michigan* was in Confederate hands.[30]

After the capture of the *Michigan* the plan called for an attack on the town of Sandusky and the capture of all available boats and ships. These vessels, convoyed by the *Michigan*, would transport the released prisoners to Cleveland. At Cleveland the Confederates were to disembark and proceed overland to Wheeling, West Virginia, and then to Virginia and safety.[31] Though Cole's plan was risky, the chance to free thousands of potential soldiers for the South appealed to Thompson so he agreed to fund the operation.

Cole arrived in Sandusky sometime in August 1864. He proceeded to carry out his part of the plan and soon introduced himself to the *Michigan*'s officers. At first Cole naively planned to try and buy the vessel outright by offering the *Michigan*'s officers two thousand dollars apiece. He soon, however, dropped the bribery attempt as it was impractical due to the strong Union attitudes among the ship's officers.[32]

Meanwhile Beall was proceeding with his side of the plan. On Sunday 18 September, he secured passage on board the steamer *Philo-Parsons* out of Detroit. In an attempt to allay suspicion Beall's party of twenty-five Confederates boarded the vessel at various stops. On Monday the 19th the *Philo-Parsons* left Detroit with Beall on board. At the next stop, Sandwich Island, four men boarded the vessel and at Malden, Ontario, twenty more men got on board carrying a large chest. Early in the afternoon Beall's men, using revolvers, hatchets, and knives contained in the chest, took control of the ship.[33]

The seizure of the vessel was bloodless. The crew was ordered by Beall to proceed to Kelly's Island which was only five miles from Johnson's Island and the *Michigan*. Four more men got on board the vessel at Kelly's Island, though none of these men was the messenger expected to have been sent by Cole to inform Beall of how the plan was proceeding.[34]

By that afternoon the *Philo-Parsons* was running low on fuel so Beall ordered that she be sailed to Middle Bass Island to pick up more wood. At 4:00 P.M. the steamer *Island Queen* made the mistake of pulling alongside the *Philo-Parsons* to acquire firewood.[35] Beall and his men were shocked to see blue-coated soldiers on board the *Island Queen* but attacked the vessel nonetheless. The fight was short and no one was seriously injured. The soldiers turned out to be off-duty men from the Toledo 130th Infantry Regiment who offered little resistance.[36]

After taking the second ship Beall realized that he could not afford to use any of his small band of men to guard prisoners so he decided to strand the passengers on Middle Bass Island by scuttling the *Island Queen*. Due to the fact that the messenger from Cole had not been at the agreed-upon location, Beall had no idea if Cole's side of the plan was still proceeding. At 8:00 or 9:00 P.M. the *Philo-Parsons* again approached Sandusky Bay. From their vantage point the Confederates could see the *Michigan* silhouetted by the lights of Sandusky.[37] It was probably still possible at this point

29. Thompson's Report, 715-16.
30. Thompson's Report, 716.
31. Thompson's Report, 716.
32. Thompson's Report, 716.

33. Report to War Secretary E. M. Stanton from Maj. Gen. John A. Dix, 20 September 1864, *Official Records for the Union and Confederate Armies During the War of the Rebellion*, ser. 1, vol. 43, pt. 2, 225. Hereafter cited as Report to Stanton from Dix. *The Official Records of the Union and Confederate Armies During the War of the Rebellion* will hereafter be cited as *ORA*.

34. Report to Stanton from Dix, 226. Thompson alludes to a messenger in the Thompson Report, 716.

35. Report to Stanton from Dix, 226-27.

36. William Frank Zarnow, "Confederate Raiders on Lake Erie, Their Propaganda Value in 1864, Part 1," *Inland Seas* (Spring 1949), 42. Hereafter cited as Zarnow, "Confederate Raiders on Lake Erie."

37. Report to Stanton from Dix, 227.

that a light signal from Cole on board the *Michigan* could have brought Beall's men in to attempt to board the ship. No signal was given.

Without Cole's inside help the attack of twenty-nine lightly armed men on an alert, heavily armed warship had almost no chance of success. Beall reluctantly turned his commandeered vessel around and headed back toward Canada. The Confederates passed Fort Malden on the Canadian side of the Detroit River at approximately 4:00 A.M. Tuesday morning and marooned the remaining crew members of the *Philo-Parsons* on Fighting Island between Detroit and Windsor. Beall and his men then proceeded up the Detroit River to Sandwich, part of present-day Windsor.[38]

At Sandwich Beall's crew took their frustrations out on the *Philo-Parsons* by looting the vessel and then scuttling her while she was tied to the wharf. Most of the Confederate party then escaped but British authorities arrived in time to arrest two of Beall's men who were slow to leave the scene. One of these men was Beall's second-in-command Bennett G. Burley.[39]

Beall and his companions were fortunate they did not attack the *Michigan* on 19 September. Just as with the previous year's Murdaugh plan, federal officials had been tipped off in advance allowing the officers of the *Michigan* time to prepare a trap for the Confederates.

On Saturday 17 September, Lt. Col. B. H. Hill, acting assistant provost marshall general of Michigan, was contacted by unidentified Canadian informants and told that there would be an attempted hijacking of the USS *Michigan*.[40] Commander Carter was immediately informed of the plot.[41] Hill, however, felt that the attempt was too weak to succeed and ordered that it be allowed to continue in order to effect the capture of the Confederate agents involved.[42] Commander Carter would not take action until he was issued a second warning at midnight the next day.

Two hours after the midnight warning, at 2:00 A.M. on Monday 19 September, Carter sent Ens. James Hunter to arrest Cole. It was reported a short while later that a "barge returned with Cole a prisoner." In the meantime Commander Carter prepared his ship for battle.[43]

The trap set by Hill and Carter may well have worked had Cole had time to send his messenger to Kelly's Island. As it turned out, Carter realized after midnight on the 20th that the Confederates must have fled. He was, however, unable to give any immediate pursuit of the *Philo-Parsons* because of an early-morning Navy Department dispatch which ordered his vessel to remain and guard Johnson's Island.[44]

Within hours of this dispatch Carter did receive permission to pursue the Confederates and got his ship underway. On a hunch Carter steamed westward passing Middle Bass Island where he found and picked up several of the stranded passengers from the *Island Queen* and the *Philo-Parsons*. On the basis of information given by these individuals the *Michigan* raced to the mouth of the Detroit River, arriving by 10:00 A.M., two hours after the *Philo-Parsons* had been scuttled at Sandwich a short way up the river. Not wanting to encroach on Canadian territorial waters, Commander Carter had his ship reverse course back to Middle Bass Island where more refugees were picked up. The officer of the watch noted that he "saw *Island Queen* ashore on Check-a-Beona Reef but the water is too shallow to get at her."[45]

At 2:40 P.M. the *Michigan* returned to Sandusky. Commander Carter ordered a detachment of marines ashore to arrest John Robinson, a man implicated in the plot by Cole. Within an hour Robinson was in irons along with Cole on board the ship.[46] More than likely, Robinson was the messenger who was to contact Beall at Kelly's Island on the 19th.

On Wednesday the 21st, the *Michigan* was again out patrolling Lake Erie, this time looking for the *Philo-Parsons*. Commander Carter was now aware that the *Philo-Parsons* had been hijacked by Confederates but he didn't know that she had been abandoned by the raiders early the previous day. When the lookout suddenly shouted that he spotted the *Philo-Parsons* the *Michigan* went to general quarters and three 24-pound Dalgren

38. Ibid.

39. Thompson's Report, 716; Zarnow, "Confederate Raiders on Lake Erie," 42.

40. Report to Stanton from Dix, 226.

41. Commander Carter to Navy Department, 26 September 1864, *ORN*, ser. 1, vol. 3, 220-21.

42. Letter from B. H. Hill to Maj. C. H. Potter, assistant adjutant general, 21 September 1864, *ORA*, ser. 1, vol. 43, pt. 2, 228.

43. Log entry, 19 September 1864, Rough Log, 24 July 1864–3 August 1866.

44. Navy Department Dispatch, 20 September 1864, *ORN*, ser. 1 vol. 3, 219.

45. Log entry, 20 September 1864, Rough Log, 24 July 1864–3 August 1866.

46. Ibid.

howitzers were loaded. A shot was fired over the bow of the small side-wheeler which hove to. A party of sailors and marines boarded the steamer and were surprised not to find any Confederate agents. The *Philo-Parsons* owner, having discovered her scuttled in the Detroit River, raised her and had the vessel seaworthy in less than a day.[47]

On 22 September, with the *Philo-Parsons* incident apparently over, Commander Carter requested that his prisoners, Cole and Robinson, be turned over to the area provost marshall.[48] While the transfer of prisoners was taking place a locally destructive storm hit the island and blew the roof off the officers' quarters. The island prisoners, thinking that the damage had been caused by the *Michigan*'s guns in the hands of fellow Confederates, attempted unsuccessfully to escape.[49]

After the *Philo-Parsons* incident the possibility of further Confederate raids out of Canada had to be taken more seriously by the U.S. military. The patrols of the *Michigan* became more active and less predictable. She stopped suspicious-looking ships with shots across their bows or blank cartridges.[50] Toward the end of the 1864 sailing season the *Michigan* began searching vessels in various lake ports for gunpowder, arms, and ammunition in an effort to thwart threats of violence from the draft resistance.[51]

On 9 November, Commander Carter received another warning from the Navy Department stating that the propeller ship *Georgian* was rumored to have been purchased by Confederate agents in Canada and was being armed for an attack on lake cities.[52] Carter had sent a report two days earlier stating that he did not believe that the rumors originating out of Buffalo about an armed Confederate raider were true.[53] Carter knew that even had the rumors been true, Lieutenant Colonel

47. Log entry, 21 September 1864, Rough Log, 24 July 1864-30 August 1866.

48. Commander Carter to Navy Department, 22 September 1864, *ORN*, ser. 1, vol. 3, 220.

49. Commander Carter to Navy Department, 26 September 1864, *ORN*, ser. 1, vol. 3, 220-21.

50. Log entry, 25 September, Rough Log, 24 July 1864-30 August 1866. This log entry is an example, in this instance the *Michigan* fired a blank cartridge at the steamer *Clifton*.

51. Commander Carter to Navy Department, 6 October 1864, Sandusky, Ohio, *ORN*, ser. 1, vol. 3, 220.

52. Navy Department Communication, 9 November 1864, *ORN*, ser. 1, vol. 3, 352.

53. Commander Carter to Navy Department, 7 November 1864, *ORN*, ser. 1, vol. 3, 349.

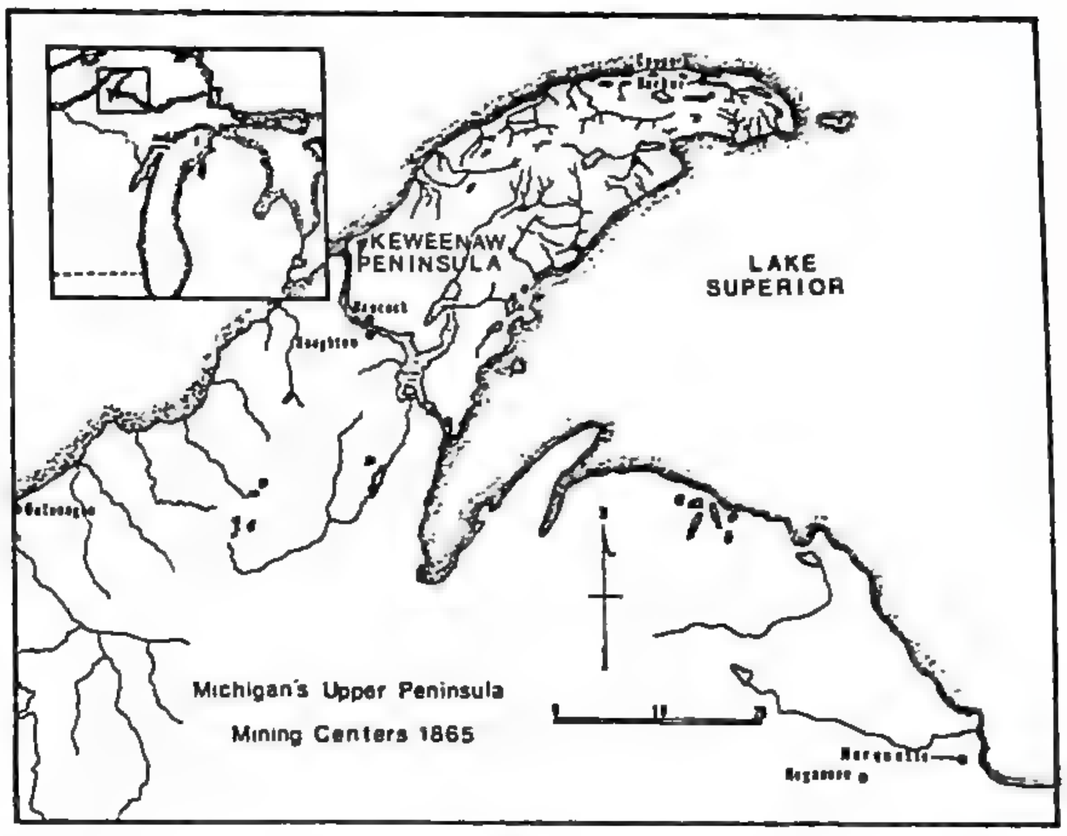


Illustration by the author.

Hill had armed two tugboats and was watching every move that the *Georgian* made from Detroit. However, just to be safe Carter assigned two of his men to infiltrate Canada and attempt to sign on as crew members of the *Georgian*. Apparently the men were successful for they later reported that they "were on board the *Georgian* from day to day, swearing that they would like nothing so well as to have a fight with the Yanks, and they would release every prisoner at Johnson's Island."[54]

Despite Carter's assurances that the *Georgian* was harmless, the Navy Department ordered him to detain and search the vessel if she were found in United States waters.[55] This seizure was accomplished on 20 November 1864. Hill's tugboats spotted the *Georgian* on Lake St. Clair and boarded her. Although the *Georgian* was thoroughly searched nothing out of the ordinary was found so the vessel was allowed to pass.[56]

The *Georgian* spent the winter at Collingwood, Ontario, where, true to the rumors, she was fitted out with a ram bow. The *Michigan*'s two crew members were still on the *Georgian* and informed the *Michigan*'s new commander Francis A. Roe of the ram. Roe immediately informed the State Department. An incensed Secretary of State Seward wrote to British authorities who in turn confiscated the vessel and delivered her to U.S. officials.[57] Interestingly, the *Georgian* episode was yet

54. Roe, "Lake Frontier During the War of the Rebellion," 546.

55. Navy Department Order, 16 November 1864, *ORN*, ser. 1, vol. 3, 375.

56. Commander Roe to Navy Department, 6 December 1864, *ORN*, ser. 1, vol. 3, 388-89.

57. Roe, "Lake Frontier During the War of the Rebellion," 547.

another plot underwritten and planned by Jacob Thompson and John Y. Beall.[58]

When the ice began to melt in the spring the *Michigan*'s new commander began to prepare his vessel for the 1865 cruising season. Lieutenant Commander Roe had seen much action during the war including a bloody engagement on 5 May of the previous year in which his vessel the *Sassacus* was badly mauled by the Confederate ironclad ram *Albemarle* in the waters of North Carolina.[59] Bad health in the form of bilious fever forced Roe to transfer to a less active command, hence, his orders to replace Carter.[60] With a change in commander the *Michigan*'s summer routine also changed. The Navy Department ordered Roe to use the port city of Detroit as the vessel's summer station instead of Erie. From Detroit the ship could more easily run to the upper lakes as the need arose.[61]

By May 1865 the Civil War was nearly over and Abraham Lincoln had become a casualty of the war, shot while attending a play at Ford's Theater in Washington. The disorder, fear, and apprehension caused by the war did not, however, disappear immediately. This was particularly true on the Great Lakes where the war was slow to be felt and slow to end.

While in Detroit on 22 June, Commander Roe reported, "Hearing that rebel emissaries were going to some points on Lake Superior for the purpose of organizing a piratical raid down all the lakes."[62] Roe wasted little time navigating his vessel across Lake Huron and into Lake Superior but as the *Michigan* passed the beautiful and uninhabited shores of the Pictured Rocks, on the north shore of Michigan's Upper Peninsula, he could not help but order his crew to anchor for a time in the lee of Grand Island. Commander Roe related,

> Here at anchor for a few days,—in the Solem silence, the darkness of the enormous forest, the absence of all human life, strife, and activity,—it was hard to conceive that in a far-away State the clangor and crash, the roar and noise of war were going on. It was an almost unearthly relief to find one's self cut off utterly from the railway, the telegraph, the mails and the haunts of men.[63]

With a painful sense of duty Roe and the other veterans on board the *Michigan* sailed from Grand Island and arrived at Marquette, Michigan, on 3 July 1865. The commotion brewing in Marquette came as a stark and unwelcomed contrast to the beauty and silence of the Pictured Rocks. Before the ship could be moored to a berth the crew noticed the townspeople crowding the shore shouting and waving white flags and linen. A strike was underway at a nearby iron ore mine.[64] Apparent victims of the precipitous economic slump associated with the war ending, the miners decided to take their frustrations out on the town of Marquette.[65] The arrival of the USS *Michigan* was a great relief to the frightened townsfolk.

Roe immediately armed his sailors and marines with pistols and Sharp's breach-loading rifles. Sailors and civilians then worked together loading the *Michigan*'s two 12-pound howitzers on railroad flatcars. The guns were placed at the front of the cars and an armored casemate of boiler iron was built around them. Once this was done the *Michigan*'s landing party, under Roe's command, boarded a train pushing the flatcars in front of them and proceeded to the miner's camp. At the mining camp Roe issued an ultimatum to the miners. They were to go back to work within twenty-four hours or "the encampment would be stormed by shot and shell."[66]

The miners, surprised to see federal troops and cannon arrive so quickly, gave in to Roe's demands and the strike immediately collapsed. Roe kept the *Michigan* in Marquette for several more days to make sure there was no more trouble. The landing party and the howitzers were reboarded and the warship left for the towns of Houghton and Hancock.[67]

Houghton and Hancock were copper mining centers located at the base of the mountainous Keweenaw Peninsula. A narrow inundated cut called Lake Portage separated the peninsula from the mainland. The *Michigan* demonstrated the usefulness of her shallow seven-foot draft on 8 July by sailing through Lake Portage to reach Houghton. Roe remarked that "the branches of

58. Winks, *Canada and the United States*, 308.

59. William N. Still, *Iron Afloat* (Vanderbilt Press, 1971), p. 164.

60. Commander F. A. Roe to Navy Department, 13 September 1865, *ORN*, ser. 1, vol. 3, 591.

61. Roe, "Lake Frontier During the War of the Rebellion," 548.

62. Commander F. A. Roe to Navy Department, 13 September 1865, *ORN*, ser. 1, vol. 3, 590.

63. Roe, "Lake Frontier During the War of the Rebellion," 549.

64. Ibid.; Commander F. A. Roe to Navy Department, 13 September 1865, *ORN*, ser. 1, vol. 3, 590.

65. J. G. Randall, David Donald, *The Civil War and Reconstruction*, 2nd ed. (Boston, 1961), p. 538.

66. Roe, "Lake Frontier During the War of the Rebellion," 550.

67. Roe, "Lake Frontier During the War of the Rebellion," 550; Commander F. A. Roe to Navy Department, 13 September 1865, *ORN*, ser. 1, vol. 3, 590.

the overlapping trees swept the hurricane deck as she steamed through. To a sailor reared and bred on the ocean it was a novel experience."[68]

The *Michigan* arrived at Houghton to find much the same thing was happening as had occurred at Marquette. The copper miners were on strike. Roe realized that the region was too mountainous for the vessel's artillery to support armed operations by a landing party so rather than risk a confrontation, he used psychological pressure on the miners. The *Michigan*'s crew were ordered to set up target ranges for small arms and the big guns. A few days of cannonading and small arms fire from the vessel convinced the miners to go back to work.[69]

Shortly after the miners went back to work Lieutenant Commander Roe decided that the mines in Houghton and Hancock were working smoothly enough for the vessel to leave. A course was plotted back to Marquette and the *Michigan* arrived there by 13 July. The iron miners, emboldened by the absence of the *Michigan*, had renewed their strike a few days before the second arrival of the ship. Not only were the miners refusing to work but to insure that they were not again surprised by a trainload of armed sailors and marines they cut all rail communication to and from Marquette.[70]

Once again a party of marines and sailors armed with the two 12-pound howitzers boarded a train. This time, however, Roe wired the army for reinforcements as he could not approach the mining camp with his artillery. Ten days later, on 23 July, an infantry company arrived from Chicago. The arrival of the army ended the strike and while the army unit stayed to squelch further disturbances, the *Michigan* returned to Detroit.[71]

During that and the following month Roe entertained several notables on board his vessel, including Prussian Minister Baron Gerolt and Gen. Ulysses S. Grant, but the agitation caused by the Civil War on the Great Lakes still did not cease.[72] In September the *Michigan* arrived in Buffalo, New York. Although the war had ended several months before, the fear of Confederate reprisal had not completely disappeared. Roe reported that "the continued presence there of the *Michigan* was of the greatest importance, for even yet the fear that the city might be fired was ever present and ever pressing."[73]

Finally by the winter of 1865-1866 the threat of Confederate reprisals and guerrilla warfare on the Great Lakes subsided. The service provided by the USS *Michigan* in the Northern Theater, though historically inconspicuous, proved invaluable to the Union. The *Michigan* survived the war to become one of the longest continually commissioned vessels in United States Navy history, having her name changed in 1905 to USS *Wolverine*. She became a historic treasure, yet met her end ignominiously at an Erie scrapyard in 1949.

68. Roe, "Lake Frontier During the War of the Rebellion," 550.

69. Ibid., 551; Commander F. A. Roe to Navy Department, 13 September 1865, *ORN*, ser. 1, vol. 3, 590.

70. Commander F. A. Roe to Navy Department, 13 September 1865, *ORN*, ser. 1, vol. 3, 590.

71. Ibid., 590-91.

72. Ibid., 591.

73. Roe, "Lake Frontier During the War of the Rebellion," 551.

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Monitor Companies: A Study of the Major Firms That Built the USS *Monitor*

WILLIAM N. STILL

USS *Monitor* was the product of a number of ironworks, foundries, and machinery manufacturing firms. With the exception of one Baltimore company, all of them were located in New York State, the majority in New York City. Although a large number of these firms were small establishments, selected because of the necessity to complete the ship as quickly as possible, a number were large, prosperous, and well-established companies. Their composite history illustrates industrial growth of the United States during the nineteenth century, especially its initial development. *Monitor*'s "builders" were mechanics, inventors, engineers, and businessmen. They were intimately associated with technological change, yet they were generally self-taught, working largely without the benefit of theoretical background.

The physical environment of the United States provided both the incentive and the means to develop new industry, transportation facilities, and the technology that accompanied this. The United States achieved extraordinary expansion during the first half of the nineteenth century—nearly 1.8 million square miles—yet its population remained small and scattered. Transportation facilities to link up the far-flung territory were essential and this need provided opportunities for inventiveness and exploitation. The transportation revolution cheapened and facilitated the movement of goods and provided an impetus for industrial growth. The country's natural resources, virtually untapped at the century's beginning, were discovered and developed. This was particularly true of coal and iron.

The nineteenth century is sometimes described as the age of coal, iron, and steel, with the United States emerging as a leading nation in that epochal age.[1] At the beginning of the century the great bulk of iron manufactured was produced by smelting and refining.[2] Small ironworks were found in every state based upon ore from a nearby mine or bog and upon charcoal for fuel. In the 1820s, with the emergence of small factories, specialization appeared in the manufacture of iron products. The manufacture of farm machinery and implements followed by household products provided the major market for the iron industry.[3]

The development of rolling mills was a major factor in the iron industry's expansion. The first angle iron and probably the first regular bars were rolled in the United States in 1817.[4] By 1830 the manufacture of rolled and hammered iron products amounted to 113,000 tons. During the following two decades, the production of rolled iron would expand rapidly, totalling more than 500,000 tons at the outbreak of the Civil War.[5] In 1860 almost one million tons of iron ore were produced. In that year there were 256 ironworks in twenty states producing bars, sheet, and railroad iron.[6]

Almost 60 percent of the country's iron ore in 1860 came from Pennsylvania, followed by Ohio and New York. The Empire State's output totalled 74,645 net tons from fifteen furnaces. Most of the ore was found in

1. See William T. Hogan, *An Economic History of the Iron and Steel Industry in the United States* (Lexington, Mass., 1971); Peter Temin, *Iron and Steel in Nineteenth-Century America: An Economic Inquiry* (Cambridge, Mass., 1961); and Elting E. Morison, *From Know-How To Nowhere, The Development of American Technology* (New York, 1974), hereafter cited as Morison, *From Know-How to Nowhere*.

2. Louis C. Hunter, "Heavy Industry Before 1860," in *The Growth of the American Economy* (New York, 1944), ed. Harold F. Williamson, p. 211; see also Douglas A. Fisher, *The Epic of Steel* (New York, 1963).

3. Fisher, *The Epic of Steel*, p. 97; George Rogers Taylor, *The Transportation Revolution, 1815-1860* (New York, 1951), p. 208.

4. Fisher, *The Epic of Steel*, p. 98. Redlich says 1819. Fritz Redlich, *History of American Business Leaders: Theory, Iron & Steel, Iron Ore Mining* (Ann Arbor, Mich., 1940), I:83.

5. Fisher, *The Epic of Steel*, p. 99.

6. Hogan, *An Economic History* I:5, 12; Fisher, *The Epic of Steel*, p. 99.

two localities, the southern highlands and the area around Lake Champlain. New York's rise to distinction in iron manufacturing dates from the 1830s. By 1840 New York emerged as the leading producer in bar, sheet, and railroad iron, with 195 establishments turning out more than 4 million dollars' worth.[7] Among these were several ironworks later involved in building the *Monitor*. Two cities, New York and Troy, became leaders in the fabrication of iron and steel products.

In New York City, Holdane & Company, a small establishment that specialized in "Boiler and Sheet Iron, Rivets, Welded Tubes, Etc.," was a subcontractor to provide 125 tons of armor plate as well as bar and angle iron for *Monitor*.[8] Little has been learned about its prewar business activities and, in fact, Trow's New York City Directory for the year ending 1 May 1863 does not list Holdane & Company. Nevertheless, the business continued to exist and prospered during the war and afterwards.

In 1854 Robert G. Dun joined the Mercantile Agency, a firm that specialized in gathering information on merchants and businesses throughout the country. This information was frequently used in business transactions involving credit. Credit rating became standard practice and was a criteria used to determine the economic soundness of a merchant or business firm. Dun provided reports on a number of the *Monitor* companies including Holdane. The earliest R. G. Dun report on the company is dated 1860. It states that the company had trouble during the panic of 1857. In January 1860 Dun mentioned that Holdane was "still considerably impaired . . . and the indications generally are that they will not soon recover their former good business and position." However, the report also stressed that "they have the reputation of being sharp and shrewd financiers."[9] Apparently part of their decline in business was the result of H. Abbott & Sons removing their account from Holdane. The New York ironworks had been the exclusive agent for the Abbott's Baltimore rolling mill until Abbott decided to establish its own business office in New York City.[10] The secession crisis improved the firm's financial situation. Dun reported on 11 April 1861, one day before Fort Sumter was fired on, "that their business has been lately improved although not as strong as they were [previously]."[11]

Holdane was representative of a number of small establishments scattered throughout New York City. The port had more ironworks than any other locality in the state, but the two largest were at Troy, a small city 150 miles up the Hudson River. Strategically located near large deposits of iron ore, Troy was also a transportation center with both water and rail links to New York City. At the outbreak of the Civil War, eight blast furnaces, twenty forges, three rolling mills, and two foundries were located in Troy.[12] Included were two establishments, the Albany Iron Works and the Rensselaer Iron Works, that produced iron for *Monitor*. Three of the city's leading businessmen, Erastus Corning, John Flack Winslow, and John Griswold, all associated with the two ironworks, were involved in building the *Monitor*.

John Winslow and John Griswold's involvement with the *Monitor* are well known, but that of Erastus Corning is not. According to Corning's biographer, he was probably a "silent partner."[13] In 1861 he was a member of Congress and could not be a contractor with the federal government. Corning was a native New Englander who served as an apprentice in a Troy hardware store. He began his career as an iron manufacturer in 1826 when he purchased a small foundry and rolling mill that specialized in producing nails from imported bar iron. The Albany Nail Factory, as Corning named his company, initially employed thirty-four workers.[14] Corning personally devoted little time to the factory. Shortly after purchasing the Troy establishment he moved to Albany and became involved in banking, local politics, and railroad promotion. During the first ten years the nail factory was not financially a success. In 1837 Cor-

7. Hogan, *An Economic History* I:12-13; *History of The State of New York* (6 vols., Port Washington, N.Y., 1962), V:206-8.

8. Holdane & Company to John Griswold, 19 October 1861, John Griswold Papers, Division of Armed Forces History, Smithsonian Institution, Washington, D.C., hereafter cited as Griswold papers; drawing of angle iron provided Holdane & Company, 14 October 1861, copy in *Monitor* Archives, Program in Maritime History and Underwater Research, East Carolina University, Greenville, N.C.; *The Scientific American*, new series, V (23 October 1861): 331.

9. New York, 323:890a, R. G. Dun & Co. Collection, Baker Library, Harvard University Graduate School of Business Administration, Boston, Mass., hereafter cited as Dun Col.

10. New York, 393:890a, Dun Col.

11. New York, 393a:890a, Dun Col.

12. A. Z. Holley and Lenox Smith, "American Iron and Steel Works," *Engineering* XV (December 1880): 590; Edward Hungerford, *Pathway of Empire* (New York, 1935), p. 286.

13. Irene D. Neu, *Erastus Corning, Merchant and Financier, 1794-1872* (Ithaca, N.Y., 1960), p. 54, hereafter cited as Neu, *Corning*.

14. Neu, *Corning*, p. 39; "Erastus Corning," *Dictionary of American Biography* IV:446, hereafter cited as *D.A.B.*; Arthur J. Weise, *Troy's One Hundred Years, 1789-1889* (Troy, N.Y., 1891), p. 264, hereafter cited as Weise, *Troy*.

ning hired John Winslow as manager. Winslow not only ran the company, but became a partner in it. The firm changed its name to Corning, Horner, & Winslow, and the factory was renamed the Albany Iron Works.[15]

John Winslow, a New Englander from Vermont, was the son of an ironmaster. After briefly serving as a clerk in a mercantile house, he entered the iron business. He worked for two years with an ironworks in New Jersey before purchasing a small iron foundry in that state. He had six years of experience in iron manufacturing when he agreed to become manager and a partner of the Albany Iron Works.[16]

Although partners in the Albany Iron Works changed, both Corning and Winslow remained associated with it until they retired from professional life. Corning left the actual running of the factory to Winslow, but according to his biographer all major decisions were made with his concurrence.[17]

Yet it was Winslow who developed the ironworks into one of the largest in New York. According to J. Leander Bishop, Winslow was a "genius" in the iron business. He had, according to another authority, an "uncanny sense" of what would prove successful in the manufacture of iron.[18] A year after he took over, the ironworks began puddling, or converting pig iron into wrought iron. The coming of the railroad offered another opportunity and by the 1830s a factory had been added for making boiler rivets and spikes for railroads and vessels. Apparently the Albany Iron Works provided spikes for most of the railroads in New York State and as far west as Cleveland, Ohio.[19] Winslow also redesigned and enlarged the rolling mill at Albany Iron Works. The modified facility included eighteen puddling and heating furnaces, four complete trains of rollers, Winslow's patented rotary squeezer with shears, roller lathes, wrought railroad-chair machinery, hammers, and five steam engines to run the different machines.[20]

15. Weise, *Troy*, p. 264; Neu, *Corning*, pp. 39-40; Redlich, *History of American Business Leaders* I:96.

16. Samuel Rezneck, "John Flack Winslow (1810-1892), Troy Iron and Steel Master," in *Profiles Out of the Past of Troy, New York Since 1789* (Troy, N.Y., 1946), p. 97.

17. Neu, *Corning*, p. 42.

18. Redlich, *History of American Business Leaders* I:96; J. Leander Bishop, *A History of American Manufactures from 1608 to 1860* (3d ed., 3 vols., New York, 1966), III:251.

19. Neu, *Corning*, pp. 42-43. This work is based on an extensive examination of the Corning manuscript collection. It is the best account of the early years of the ironworks.

20. Bishop, *American Manufactures* III:250. The "chair-machinery" produced rails.

In the 1850s, two additional rolling mills were added, one run by water power and the other by steam, along with an axle plant. By the Civil War, the establishment covered some forty or fifty acres of land with "numerous buildings, constituting a small village in itself."[21] By that date more than 750 men were employed.

Corning and Winslow, as typical entrepreneurs, were involved in a variety of business enterprises. Corning was prominent in railroad development, particularly on the lines that ultimately became the New York Central system. Following the New York Central's consolidation, Corning was elected its first president. Winslow was also involved in railroad and banking enterprises and in later years was president of Rensselaer Polytechnic Institute from 1865 to 1868.

Both Winslow and Corning were investors in a second ironworks located in Troy, which also became involved in building *Monitor*.

In 1846 the Troy Vulcan Company erected a rolling mill. In 1853 it was converted to a rail mill and became known as the "Rensselaer Iron Company" and the following year to the "Rensselaer Iron Works." By 1856 its eighteen furnaces and four steam-driven roll trains produced 12,650 tons of rail and 862 tons of bar iron.[22] The Rensselaer Iron Works was owned by John A. Griswold, who sold a half-interest in the establishment to Corning and Winslow in 1855.[23] By 1860 the Rensselaer Iron Works was employing 350 men in the manufacture of railroad rails, and bar and sheet iron.[24]

Like Corning, John Griswold had begun his career as a clerk in a Troy hardware store. He then worked for a number of firms before entering the iron business. Winslow apparently managed the Rensselaer works as well as the larger Albany Iron Works. Griswold had no experience in iron manufacturing and, in fact, appar-

21. Bishop, *American Manufactures* III:632-33; Neu, *Corning*, pp. 42-44; the *Troy Business Directory for the Year 1861 . . .* (Troy, 1860), pp. 88, 295; Daniel J. Walkowitz, *Worker City, Company Town: Iron and Cotton-Worker Protests in Troy and Cahoes, New York, 1855-84* (Urbana, Ill., 1978), p. 23.

22. J. P. Lesley, *The Iron Manufacturer's Guide to the Furnaces, Forges, and Rolling Mills of the United States* (New York, 1866), p. 225.

23. Neu, *Corning*, pp. 47-48. Weise claims that Winslow owned the mill first and sold it to Griswold. Weise, *Troy*, p. 265. The Troy Business Directory of 1862 includes an advertisement for the Rensselaer Iron Works that lists Griswold as "agent." *The Troy Directory for the Year 1862 . . .* (Troy, n.d.), p. 1. Advertising at back of the directory with new pagination. Copies of Troy directories in Library of Congress.

24. "John Griswold," *D.A.B.* VIII:8-9; Neu, *Corning*, pp. 47-49; Rezneck, "John Augustus Griswold (1818-1872), Business and Civil Leader of Troy," in *Profiles out of the Past of Troy, New York Since 1789*, pp. 101-3.

ently was more interested in politics. He would be elected mayor of Troy in 1855, the year that he sold partnerships in the works to Corning and Winslow. Although an unsuccessful candidate in 1860, he was elected to Congress in 1862. One writer mentioned that "it was undoubtedly this combination of business and politics which gave special and distinctive importance to his career."[25] As with the other iron manufacturers, Griswold invested in other businesses, including banks, railroads, and ironworks.

When the Civil War broke out, Troy was recognized as an iron manufacturing center. The Albany and Rensselaer ironworks together employed more than a thousand men, and were considered the largest producers of railroad and other iron in the United States.[26] Considering their size and prominence, their involvement in government contract work, including the fabrication of iron for warships, was not surprising.

The same, however, is not clear for another company located in Buffalo, some three hundred miles west of Troy on Lake Erie. The Niagara Steam Forge works would manufacture the massive "port stoppers" for *Monitor*'s turret.[27]

In 1851 Charles D. Delaney started a small firm which he named the Delaney Forge and Iron Company.[28] In that year the Delaware, Lackawanna & Western Railroad was completed, linking the coal fields in northwestern Pennsylvania and southern New York with Buffalo. It was no coincidence that Delaney's company started that year. To be smelted iron required coal. It was the completion of the railroad that led to Buffalo becoming an important iron manufacturing center in the 1850s. Delaney is credited with starting the iron industry in Buffalo.[29]

Charles D. Delaney, a native of Pennsylvania, entered the iron manufacturing business as an apprentice. In 1831 he moved to Buffalo where he became superintendent of construction of engines for a number of Great Lakes steamers, including the *New York, Pennsylvania* and *General Porter*.[30] He then went to work at the Novelty Iron Works. In 1841 he built the first locomotive in Buffalo and later the first railroad cars. Delaney started his ironworks in 1851, which he initially named the Delaney Forge and Iron Company. In 1853 it became the Niagara Steam Forge and would be known by that name for more than three decades. Because of ill health he sold out in 1856, but with the financial help of a local banker, T. P. Patchin, who became a partner, he acquired ownership again four years later.[31] By 1861 Delaney was advertising as a manufacturer of railroad car axles, crank axles, track and driving axles, wrought iron driving wheels, locomotive frames, steamboat propeller shafts and cranks, connecting rods, piston rods, crank pins, mill shafts, anchors, hammered bar iron and shafting of any length and size, and blacksmithing.[32] The Niagara Steam Forge works were apparently well equipped to manufacture "port stoppers" and other parts for *Monitor*.

Only one non-New York establishment was substantially involved in producing ironwork for *Monitor*. H. Abbott & Sons of Baltimore, Maryland, provided armor plate for the turret. As with the Niagara Steam Forge works, the Baltimore firm's beginning was related to railroad development. Construction on one of the first railroads in the United States, the Baltimore & Ohio, began in 1828 and by the early 1830s the railroad had proved an economic success for the investors and the city of Baltimore. Business leaders projected the city's future not only as a port but as a rail center. Baltimore's potential as a transportation center persuaded a small group of investors to develop an industrial park near the railroad and on the waterfront. They named the park "Canton."[33]

Peter Cooper was one of these investors. Cooper had designed "Tom Thumb," the first American-built loco-

25. Rezneck, "Griswold," p. 101. See also Lesley, *The Iron Manufacturers Guide*, p. 3.

26. "John Flack Winslow," *D.A.B.* X:399. The Albany Iron Works was also beginning to use steel in its manufactured railroad products. *The Scientific American*, new series, IV (5 January 1861): 3.

27. Gordon P. Watts, Jr., "Monitor of a New Age: The Construction of the U.S.S. *Monitor*," M.A. thesis, East Carolina University, 1975, p. 51; Stimers to Ericsson, 6 May 1862, John Ericsson Papers, New York Historical Society, New York City.

28. Henry P. Smith, *History of Buffalo and Erie County* (2 vols., Syracuse, 1884), II:240; Henry W. Hill, *Municipality of Buffalo, New York: A History, 1720-1923* (2 vols., New York, 1923), II:862; *The Manufacturing Interests of the City of Buffalo* (2d ed., Buffalo, 1866), p. 50.

29. Mark Goldman, *High Hopes: The Rise and Decline of Buffalo, New York* (Albany, 1983), p. 64, hereafter cited as Goldman, *High Hopes; The Manufacturing Interests of the City of Buffalo Including Sketches of the History of Buffalo* (Buffalo, 1866), p. 72. A copy of this directory is in the Library of Congress.

30. *The Buffalo City Directory for the Year 1862* (Buffalo, 1861), listed him as a ship's carpenter. See p. 170.

31. *Buffalo Commercial Advertiser*, 24 September 1883.

32. Copy of advertisement in *The Buffalo City Directory for the Year 1862*, p. 83; *The Manufacturing Interests of the City of Buffalo*, pp. 50-51.

33. Sherry H. Olson, *Baltimore: The Building of an American City* (Baltimore, 1980), p. 77.

motive for the Baltimore & Ohio Railroad.[34] Cooper bought out the other "Canton" speculators, and began to develop the property. He started an ironworks, the Canton Iron Works, to repair and construct railroad equipment. In 1836 the works were leased to Horace Abbott.[35]

Abbott, a native of Massachusetts, had been apprenticed to a blacksmith as a young boy. After serving his term of apprenticeship and a brief period as an employee, he established his own blacksmith shop. In 1836 he and his brother moved to Baltimore and rented the Canton Iron Works. Eleven years later he purchased them. Abbott was successful in making the transition from manufacturing horseshoes, tools, and small farm implements to producing large wrought iron shafts, cranks, axles, and other railroad and ship parts. The ironworks received public attention in the 1840s by forging the first large steamship shaft made in this country, a shaft designed for the Russian frigate *Kamtschatka* built in New York for Czar Emperor Nicholas I. The 6½-ton shaft and connecting rods, weighing about two-thirds that amount, were exhibited at the New York Exchange as the first heavy engine forgings made in the United States.[36] By 1850 Abbott had gained a national reputation as an ironmaster.

In 1850 Abbott added a rolling mill capable of turning out the largest rolled plate in the country at that time. The mill was enlarged in 1854 and two years later produced two thousand tons of plate.[37] Abbott continued expanding, adding a second rolling mill of the same size and capacity as the first in 1857, a third in 1859, and a fourth in 1861. Mill Number Two contained three heating and two puddling furnaces, a Nasmyth steam hammer, and one pair of ten-foot rolls, the largest in the country. More than likely these were the rolls used to make the plates for the *Monitor* and other armored vessels during the Civil War. Mill Number Three was designed to manufacture thin plates for gas pipes, boiler tubes, etc.[38] When the Civil War broke out, Abbott's establishment and the Tredegar Iron Works in Richmond, Virginia, were the two largest in the South. Tredegar would roll *Virginia's* plate and Abbott, *Monitor's*.

The mechanization of industry was an integral part of the economic revolution in the United States in the nineteenth century. Alongside blast furnaces and rolling mills developed works for the production of heavy machinery. Blowing engines for blast furnaces, and machinery for rolling mills, sawmills, sugar mills, and other industries, were developed. The most important products, however, were steam engines, both stationary and those for locomotives, steamships, and steamboats.

The mechanization of the United States, particularly during the first half of the nineteenth century, did not involve a massive shift to new power sources. American industries relied upon water as their main source of power until well into the second half of the century. A congressional report in 1838 estimated that there were some 250 or so steam engine builders, mostly very small and scattered widely. They had produced 3,000 steam engines of which 1,860 were stationary engines used primarily in industrial establishments, 350 locomotive engines, and 800 in steam vessels.[39]

Although stationary steam engines replaced water-powered machinery very slowly in the United States, the growth of the application of steam power to transportation was phenomenal. Its effect was most important to the country's development. Rosenberg wrote, "It is perhaps not too much to say that the major economic consequence of the acquisition of the steam engine in the New World before the Civil War lay in its application to new forms of transport—the steamboat and later the railroad."[40] This was perhaps an inevitable result of the nation's continental expanse, vast inland distances, and need for suitable transport. The steam engine, first in boats and later locomotives, provided the means for ful-

34. "Peter Cooper," *D.A.B.* IV:409-10. See also Allan Nevins, *Abram S. Hewitt With Some Account of Peter Cooper* (New York, 1935); and Edward C. Mack, *Peter Cooper: Citizen of New York* (New York, 1949).

35. Mack, *Peter Cooper*, p. 117. Most authorities say that Abbott purchased the ironworks in 1836, but Cooper's biographer (Mack) using his manuscripts has concluded that it was 1847.

36. "Horace Abbott," *D.A.B.* I:21; "Horace Abbott," in pamphlet file, Maryland Historical Society, Baltimore; J. Thomas Scharf, *History of Baltimore City and County* (Philadelphia, 1881), p. 427; ———, *Chronicles of Baltimore* (Baltimore, 1874), p. 490; Gary L. Browne, *Baltimore in the Nation, 1789-1861* (Chapel Hill, N.C., 1980), pp. 182, 287; Victor S. Clark, *History of Manufactures in the United States* (2 vols., New York, 1929), II:506, hereafter cited as Clark, *Manufactures;* Baltimore *Sunday Sun Magazine*, 26 July 1953. The 1858 city directory, *The Monumental City or Baltimore Guide Book*, does not mention the ironworks, but an 1864 directory does. Copies of these directories are found in the Library of Congress.

37. Lesley, *The Iron Manufactures Guide*, p. 243.

38. Bishop, *American Manufactures* III:116-17.

39. Temin, *Iron and Steel in Nineteenth Century America*, pp. 40-41; Nathan Rosenberg, *Technology and American Economic Growth* (New York, 1972), p. 64; Taylor, *Transportation Revolution*, p. 223.

40. Rosenberg, *Technology and American Economic Growth*, p. 67.

filling this need. From 1830 to 1850 steamboats dominated internal transportation in the United States on the western rivers and began to work coastwise.[41]

The same was not true of ocean transportation, however. It was not until 1838—twenty-five years after steamboats were successfully introduced—that steamship service was established on the Atlantic Ocean. Technological and economic factors handicapped the growth of oceanic steam transportation. Substantial growth would come in the 1850s. According to Cedric Ridgely-Nevitt, in *American Steamships on the Atlantic*, two events resulted in the rapid development of steamships and led to their construction in great numbers. In the late 1840s, Congress authorized subsidized mail contracts from New York to various ports in the United States and abroad. The discovery of gold in California also contributed to a shipbuilding boom.[42]

Between 1830 and the outbreak of the Civil War, New York City was the center of the steam engine industry, particularly power plants for river and ocean vessels. According to Robert Albion, "No other American port could rival the assemblage of talent concentrated in its 'iron works.' Nowhere else in the world, in fact, was there such a group except on the banks of the Clyde around Glasgow."[43] Bishop admiringly wrote:

> It has been truly remarked, that as the city of New York is sustained almost entirely by its commerce, and as this commerce is becoming every year more and more dependent for its prosperity and progress upon the power of the enormous engines by which its most important functions are now performed, the establishments where these engines are invented, made and fitted into ships, which they are destined to propel, constitute really the heart of the metropolis; that the splendor and fashion of Fifth Avenue, and of Union Square, and the brilliancy and ceaseless movement of Broadway, are mere incidents and ornaments of the structure; while these establishments, and those of kindred character and functions, form the foundation on which the whole of the vast edifice reposes.[44]

One of John Ericsson's biographers, William C. Church, quotes a letter to a newspaper which said that in 1840 there was no establishment in New York City that could "forge an ordinary steam engine shaft." This assertion may explain why Abbott & Sons in Baltimore were contracted to forge the iron shaft for the Russian frigate built in New York City. Yet, by 1853 the three largest establishments in New York City specializing in steam engine work employed more than 2,100 men. Four years later a total of 3,130 were employed in seventeen engine-building companies.[45]

In 1857 a financial panic created a brief but rather severe economic recession in the country. Hundreds of establishments either failed or were badly hurt by the crisis: Recovery was slow, particularly in the shipping and shipbuilding industries. Nevertheless, *The Scientific American* reported in 1861 that the New York City steam engine manufacturing firms were busy "at the same time last year there was not so much business going forward as there is at the present moment."[46] Among the engine manufacturing establishments in New York City at that time several worked on *Monitor* including two well-known companies, Novelty Iron Works, and Delamater Iron Works.

Novelty Iron Works, which built *Monitor's* turret, was the largest engine-building firm in the city during the 1850s. There is some disagreement about the date that the works were founded, but it apparently occurred in the late 1820s or early 1830s.[47] The establishment was started by Dr. Eliphalet Nott, the president of Union College at Schenectady and an "indefatigable inventor."[48] The occasion was the construction of a steamboat which he named *Novelty*. Nott chose the name because the vessel would be the first to use a new fuel, anthracite coal, as well as a new type of boiler and engine.[49] To fabricate some of the machinery, including one engine, Nott purchased Burnt Hill Point at the foot

41. Rosenberg, *Technology and American Economic Growth*, p. 69; Taylor, *Transportation Revolution*, p. 58.

42. Cedric Ridgely-Nevitt, *American Steamships on the Atlantic* (Newark, Del., 1981), p. 348, hereafter cited as Nevitt, *American Steamships*.

43. Robert G. Albion, *The Rise of New York Port, 1815-1860* (New York, 1939), p. 148. See also Fred E. Dayton, *Steamboat Days* (New York, 1939), p. 376; and Leonard A. Swann, Jr., *John Roach, Maritime Entrepreneur* (Annapolis, Md., 1965), p. 181. Philadelphia with firms such as Merrick & Towne, Merrick & Sons and Reaney & Neafie was a close second in engine works.

44. Bishop, *American Manufactures*, III:122.

45. *The Scientific American* IX (17 December 1853): 110; Carroll W. Pursell, Jr., *Early Stationary Steam Engines in America* (Washington, D.C., 1969). See also Pursell's dissertation, "Stationary Steam Engines in America before the Civil War," Ph.D. dissertation, University of California, Berkeley, 1964, p. 183, hereafter cited as Pursell, "Stationary Steam Engines."

46. *The Scientific American*, new series, IV (23 March 1861): 186.

47. Pursell says 1927. See *Stationary Steam Engines*, p. 24; Codman Hislop, "The S.S. *Novelty*," *New York Historical Society Quarterly* 49 (October 1965): 330 gives the date as 1831; and Dayton, *Steamboat Days* suggests 1833 (p. 382). See also Codman Hislop, *Eliphalet Nott* (Middleton, Conn., 1971), p. 352, passim.

48. Pursell, "Stationary Steam Engines."

49. Bishop, *American Manufactures* III:125-26. *Novelty* was enrolled on January 9, 1933.

of 14th Street on East River. He converted a number of farm buildings at the Point into shops. He not only used the shops to work on *Novelty*, but other ironwork as well. For example, he began to build home heating stoves known as "Nott Stoves" which he had patented.[50]

Hezekiah Bliss, a friend of Robert Fulton and a steamboat builder, was hired as superintendent. Under his direction, the ironworks, which gradually became known in the neighborhood as the Novelty Works, began to take in more marine work. The Novelty Works continued to be the name of a location until 1855 when an incorporated company with the title of Novelty Iron Works was established.[51] In 1835 a visitor to the Novelty Works wrote that "I found an immense establishment in which were carried on all the different branches and operations in any way connected with making stoves, steam engines, boilers, and almost every article of large machinery, and even steamboats."[52]

In 1838 Nott sold the ironworks to a partnership operating under the name of Ward, Stillman & Company. Under the new management the works were greatly enlarged and began to concentrate more and more on steam engine construction. They were already building a variety of steam engines. The company was apparently one of the first establishments in the United States to construct oscillating engines for use on steamboats. In the late thirties the company gained prestige when it built the machinery for two Spanish steamships, *Lion* and *Eagle*.

In 1842 the man who would largely determine the Novelty Works's direction for the next quarter of a century joined the company as a junior partner. Horatio Allen, one of the better known engineers in the country, remained with Novelty as a partner and later president until its demise after the Civil War. The company was renamed Stillman, Allen & Company, and would remain so until 1855 when it was incorporated under the title of Novelty Iron Works with Allen as president.[53]

The New York *Daily Times* reported on 20 December 1854, that Stillman and Allen's business had declined significantly and that a large number of employees had been laid off. More than likely this was the major reason for the decision to incorporate. Needed capital could be attracted by selling stock. In addition to Horatio Allen as president, the new officers included Edward Allen, Horatio's brother. Equally important, Edward was the son-in-law of James Brown of Brown Brothers, one of the most powerful banking houses in New York City. James Brown became one of the largest stockholders in the Novelty Iron Works. Several years later, one of Brown's sons wrote, "Father owns almost the whole of the stock."[54] In later years another of the Browns, Clarence, also became deeply involved with Novelty. The Browns were not the only important stockholders, however. In 1856 R. G. Dun & Company reported that the Novelty Iron Works stock is held by "wealthy men, prominent among them James Brown."[55]

Horatio Allen was born in Schenectady, New York, in 1802 and graduated from Columbia College in 1823.[56] His father was professor of mathematics and natural philosophy and later principal of a large preparatory school at Hyde Park. Allen majored in mathematics and after briefly studying law, he entered the engineering profession. This was his principal occupation throughout his career.

Allen's professional career began during "the canal era." From the construction of the Erie Canal in the post-War of 1812 years until railroads demonstrated their superiority, the United States witnessed a canal boom with more than a hundred excavated in all parts of the country. It is not surprising, then, that Allen's first employment was with the Chesapeake and Delaware Canal Company and the Delaware and Hudson Coal Company. The latter's efforts to reach the Pennsylvania anthracite coal region resulted in Allen being sent to England to purchase railroad iron and locomotives. Allen tested the first locomotive after it was delivered to the United States. In 1829 the "Stourbridge Lion" became the first railroad engine actually to run in this country. Although the engine was never economically a

50. Hislop, "The S.S. *Novelty*," p. 329.

51. Bishop, *American Manufactures* III:126

52. Quoted in John H. Morrison, *History of American Steam Navigation* (New York, 1903), pp. 52-53. See also Dayton, *Steamboat Days*, pp. 43, 382; and Hislop, "The S.S. *Novelty*," p. 329.

53. New York, vol. 368, p. 401, Dun Col.

54. John A. Kouwenhoven, *Partners in Banking . . . Brown Brothers, Harriman & Co., 1818-1968* (Garden City, 1968), p. 241. See also John Crosby Brown, *A Hundred Years of Merchant Banking* (New York, 1909), p. 241.

55. Kouwenhoven, *Partners in Banking*, p. 153; New York, 368:401, Dun Col.; Peter Cooper also purchased stock in the company. Mack, *Peter Cooper*, p. 199.

56. There are a large number of brief biographical sketches of Allen. For some of the better ones see Alfred Mathews, "Horatio Allen," *Cassier's Magazine* X (May-June 1896): 471-74; Edward H. Mott, *The Story of Erie* (New York, 1908), p. 462; "Horatio Allen," *D.A.B.* I:193-94; "A Memorial of Horatio Allen," *Transactions of the American Society of Mechanical Engineers* II (November 1889-May 1890): 1156-81.

success, Allen's involvement resulted in his appointment as chief engineer of the South Carolina Railroad Company later that year.[57]

As chief engineer of the company, Allen surveyed the railroad's proposed route from Charleston to the Savannah River. He also developed plans for a locomotive that would be built under his supervision at the West Point Foundry in New York. This was the first railroad engine built in the Western Hemisphere. Because of this and the "Stourbridge Lion," Allen has been rightfully called the true father of locomotives in the United States.[58] Allen remained with the South Carolina Railroad until 1835 when he resigned and went abroad.[59] Three years later he settled in New York City where he was appointed assistant engineer of the Croton Aqueduct. The chief engineer was John Jervis, who had been both a friend and colleague in earlier projects. The Croton Aqueduct was to provide water for New York City by means of a dam and aqueduct. It took seven years to complete it with water first being turned on in 1842.[60]

With the completion of the Croton Aqueduct, Allen looked elsewhere to utilize his engineering talents. In 1842 he became a partner in the Novelty Works, but apparently had little initial impact on the company's business activities. The following year he returned to railroads when he was appointed president of the Erie Railroad. His administration was short, less than two years. He achieved some success but was unable to solve the company's financial difficulties and in 1845 it was sold under foreclosure.[61]

Allen would become intimately involved in one more railroad venture, the Panama Railroad Company, which was incorporated in 1849.[62] There is no evidence, however, that his participation was more than perfunctory. By that time he was concentrating his energies in designing and improving marine steam engines that were being built by the Novelty Works. Allen's interest in marine engines coincided with the accelerated interest in oceanic steam transportation. During the 1840s he took out at least five patents relating to marine steam machinery including a cut-off valve mechanism that would be used on most of the engines that Novelty built.[63] According to one engineer Allen was critical of the cut-off valve invented by John Sickel and used on the majority of steam engines. "Horatio Allen . . . fought Mr. Sickel during his whole business life and would never allow a Sickel cut-off to be applied in the Novelty Iron Works," wrote Charles Porter.[64] A number of well-known vessels, including *Adriatic* and the Collins steamships *Arctic* and *Atlantic*, had engines that included steam and exhaust valves designed by Allen.[65]

Allen was, as one writer said, "a prolific inventor." Between 1841 and 1879, he took out at least seventeen patents, the majority of which were related to steam engines.[66] He spent considerable time trying to improve oscillating cylinder engines which he recommended over side-lever engines for side-wheel steamers. Most of the engines for paddle-wheel vessels built by Novelty and the other steam machinery builders were the side-lever type. A number of the Novelty-built steamers, including *Adriatic* and *Golden Gate*, however, carried oscillating engines.[67]

The Novelty Works during these years became one of the largest establishments in the country for building marine engines. The firm's rise to prominence in the steam machinery construction field corresponded with the developing oceanic steamship business. The steam "packet" service in 1855 employed fifty-six ships, most of them new and at least half built in New York City.

57. Taylor, *Transportation Revolution*, pp. 32-52; "Allen," *D.A.B.* I: 193. See also Robert H. Thurston, *A History of the Growth of the Steam-Engine* (New York, 1878), p. 208. The *Stourbridge Lion* made only two runs and because of her weight crushed the hemlock rails. The locomotive was then put in storage and never used again. Morison, *From Know-How to Nowhere*, p. 52. For Allen's involvement with the Delaware and Hudson Company see *A Century of Progress. History of the Delaware and Hudson Company, 1823-1923* (Albany, N.Y., 1925), pp. 46-61.

58. Nevins, *Hewitt*, p. 70.

59. For Allen's work with the South Carolina Railroad see Samuel M. Derrick, *Centennial History of South Carolina Railroad* (Columbia, S.C., 1930), pp. 31-78; Morison, *From Know-How to Nowhere*, pp. 54-56.

60. Nelson M. Blake, *Water for the Cities, A History of The Urban Water Supply Problem in the United States* (Syracuse, 1956), pp. 145-53; Morison, *From Know-How to Nowhere*, pp. 62-69.

61. Nevins, *Hewitt*, p. 199; Mott, *The Story of Erie*, pp. 67-73; Edward Hungerford, *Men of Erie* (New York, 1946), pp. 65-67.

62. Alex Perez-Venero, *Before the Five Frontiers, Panama From 1821-1903* (New York, 1978), p. 63.

63. "A Memorial for Horatio Allen," *Transactions of the American Society of Mechanical Engineers*, p. 1740; T. Main, *The Progress of Marine Engineering* (New York, 1893), p. 28, hereafter cited as Main, *Marine Engineering*.

64. Charles T. Porter, *Engineering Reminiscences Contributed to "Power" and "American Machinist"* (New York, 1908), p. 254, hereafter cited as Porter, *Engineering Reminiscences*.

65. Nevitt, *American Steamships*, p. 153. True also of the *Adriatic*.

66. "Memorial for Horatio Allen," *Transactions of the American Society of Mechanical Engineers*, p. 1174.

67. "Memorial for Horatio Allen," *Transactions of the American Society of Mechanical Engineers*, pp. 1174-75.

The total steamship registered tonnage in the United States jumped from 5,631 in 1847 to nearly 100,000 in 1860.[68] New York City was the most important shipbuilding center in the country and Novelty provided the power plants for more steamers than any other establishment.

The list of names of the vessels in the two decades prior to the Civil War with Novelty-built engines reads like a who's-who of American vessels for the period. *Southerner* was launched in 1846, the second actual oceangoing steamship built in the United States. She was built by William H. Brown, New York shipbuilder, and Novelty provided her machinery.[69] In March 1845 Congress passed a law calling for the contracting of the mails to foreign countries. This resulted in the organization of new steamship lines and the construction of new steamers. The Ocean Navigation Company built two new vessels, *Washington* and *Hermann,* with side-lever engines constructed by Novelty.[70] These ships were followed in 1849-1850 by four steamers constructed for the Collins Line, which was established by American entrepreneur Edward Knight Collins, to compete with the British Cunard Line. Two of the four Collins steamers, *Atlantic* and *Arctic,* received their machinery from the Novelty Works.[71] The loss of *Arctic* in 1854 was a major, early American marine disaster. Among the passengers who lost their lives was the family of Edward Allen, a Novelty official and Horatio Allen's brother.[72]

Another fleet of steam packets was built in the late 1840s to run to and from L'Havre, France. They included the *Arago, Franklin,* and *Humboldt* with Novelty-built engines.[73]

68. *Annual Report of the U.S. Commissioner of Navigation* (Washington, D.C., 1894), p. 268. For Novelty's prominence see Louis C. Hunter, *A History of Industrial Power in the United States 1780-1930. Volume Two: Steam Power* (Charlottesville, Va., 1985), 242-43.

69. Nevitt, *American Steamships,* p. 98.

70. Carl C. Cutler, *Queens of the Western Ocean* (Annapolis, Md., 1961), p. 277. Horatio Allen was one of the company's directors. Newitt, *American Steamships,* pp. 128-30. See also David B. Tyler, *Steam Conquers the Atlantic* (New York, 1939), pp. 154-56.

71. Main, *Marine Engineering,* pp. 30-31; John G. B. Hutchins, *The American Maritime Industries and Public Policy, 1789-1914* (Cambridge, 1941), pp. 354-55; Frank C. Bowen, *A Century of Atlantic Travel, 1830-1930* (Boston, 1930), pp. 56-57.

72. Alexander Crosby Brown, *Women and Children Last: The Loss of the Steamship Arctic* (New York, 1961). Thurston in *A History of the Growth of the Steam Engine* said that the *Arctic*'s machinery "was for that time remarkably powerful and efficient," p. 290. See also *The Scientific American* IX (1 October 1853): 78.

73. For a detailed account of the Atlantic liners including those with Novelty-supplied machinery see Nevitt, *American Steamships.*

In 1847 Congress initiated another mail subsidy which resulted in two steamship lines being organized for the Panama route. The mail, passengers, and a limited amount of light freight were carried by steamer from eastern U.S. ports to Panama. Passengers and cargo crossed the isthmus by rail and then by steamer to San Francisco. The government also subsidized the Pacific steamship lines. A group headed by William H. Aspinwall of New York organized the Pacific Mail Steamship Company to receive the mail contract for the "Panama route." The discovery of gold in California would enhance the importance of the Panama route. New York shipbuilders produced most of the liners for this route, and twenty-two out of sixty-four engines built in New York City came from Novelty.[74]

Stillman, Allen & Company also provided machinery for *Adriatic* (350 feet long, 50 feet wide, and 5,000 tons displacement), and when completed was the largest side-wheel steamer in the world, except for Britain's *Great Eastern. Adriatic* was also considered the fastest steamship afloat for several years, once steaming fifteen knots in smooth water. Her two oscillating engines had cylinders 101 inches in diameter with twelve-foot strokes. The paddle wheels were 40 feet in diameter and their hubs were probably the largest castings for steamships made in the United States before 1860.[75] Unfortunately, *Adriatic*'s machinery had major defects, primarily in the valves and valve operating gear designed by Horatio Allen. Because of these deficiencies, the ship's maiden voyage was delayed more than a year. This expensive delay was a factor in the failure of the Collins Line and would also seriously affect the prosperity of the Novelty Iron Works.[76]

Novelty provided the machinery for a number of other pre-Civil War ships. *Nashville,* launched in 1853, had side-level engines. This vessel became a Confederate raider during the Civil War and was destroyed in 1863.[77] In 1854 the Samuel S. Sneeden shipyard constructed the paddle-wheeler *Metropolis* at Greenpoint,

74. John Haskell Kemble, *The Panama Route, 1848-1869* (Berkeley, 1943), pp. 118-19. For a list and brief history of these vessels see Kemble, pp. 213-51.

75. Dayton, *Steamboat Days,* p. 383; Porter, *Engineering Reminiscences,* p. 55; Nevitt, *American Steamships,* pp. 167-69.

76. Tyler, *Steam Conquers the Atlantic,* p. 237; Nevitt, *American Steamships,* pp. 167-69; New York, 368:440, Dun Col.

77. Nevitt, *American Steamships,* pp. 262-63. See also Franklin N. Chance et al., *Tangled Machinery and Charred Relics: The Historical and Archaeological Investigation of the C.S.S.* Nashville (Orangeburg, S.C., 1985).

Long Island. Built for the Fall River Line, she was considered "the largest steamboat in the world."[78] In 1850 Novelty built the machinery for the Pacific Mail steamer, *Golden Gate*, and according to *The Scientific American* the wrought iron center shaft and four cranks for this vessel were "the largest and heaviest pieces of wrought iron mechanism ever made in this city, and, if we are not greatly in error, in this country."[79] *Golden Gate* was one of Pacific Mail's best steamers.

The company also provided the machinery for a number of vessels built for other countries including at least two for Russia and one each for Turkey and Brazil.[80]

Novelty's lead in building the machinery for steamers was not the result of a clear superiority over the other constructors, nor cheaper prices, but rather the effect of Horatio Allen's personal and business ties with key individuals associated with various financial and shipping interests. For example, he was associated with William Henry Aspinwall in the Panama Railroad Company; Aspinwall was instrumental in developing the Pacific Mail Steamship Company. The Brown Brothers banking firm provided much of the financial backing for Pacific Mail, and Allen and the Novelty Works had a close relationship with Brown Brothers. In a suit adjudicated in 1856 involving Allen and the Novelty Iron Works, a lawyer stated that Edward Collins of the Collins Line was forced to use Novelty-built machinery in his vessels. "He was tied hand and foot by Brown, Brothers & Company at the feet of Horatio Allen."[81]

Although Novelty's reputation to a great extent rested on the construction of marine machinery, the ironworks manufactured a variety of products, ranging from sugar mill machinery to fire engines. According to one account more than seventy-five steam fire engines designed by Lee & Larned were built by Novelty. "The Fire Department of [New York City] . . . was completely equipped with them," Thomas Porter wrote.[82] In 1844 Novelty built two iron vessels for the national government, one a surveying steamer, and the other a cutter for the revenue cutter service.[83] Occasionally, the ironworks acted as the agent for products, including machinery, manufactured by other establishments.[84]

Novelty's business fluctuated in the decade preceding the Civil War. The company expanded and prospered early in the decade because of the city's thriving shipbuilding industry. One authority estimated that Novelty's business in one year was worth more than $1.5 million.[85] In 1850 the works stretched for nearly a thousand yards along the East River from Twelfth to Fourteenth Street. It included an iron foundry with four furnaces, smith's shop, various buildings, and two slips capable of holding eight or ten large vessels at one time. Eleven hundred and seventy people were employed in the ironworks that year. The steam power plant, boiler factory, explosions from gases in the molds, combined with the billowing smoke from more than thirty forges in the blacksmith shop created, according to one observer, an extremely noisy and smoky area.[86]

The city's shipbuilding business began declining in the mid-fifties. The high cost of construction, along with the failure of some of the large lines, particularly the Collins Line, contributed to the decline. Whereas thirty-seven steamers were launched in 1853 and forty-seven in 1854, only thirteen were completed in 1855.[87] Novelty's business was hurt, not only because of the drop in shipbuilding activities, but also because of the firm's well-publicized problems with the Collins liner *Adriatic*. The company's financial difficulties led to its reorganization in 1855. The new capital brought in by this reorganization stabilized the company's financial

78. *The Scientific American*, IX (29 April 1854): 262.

79. *The Scientific American*, new series, III (13 October 1860): 240.

80. *The Scientific American*, new series, III (1 December 1860): 256; New York, 368:440, Dun Col.

81. *The Argument of Mr. Edward N. Dickerson . . . In the Case of Sickles vs. Borden, Defended by 'The Novelty Iron Works' and Mr. Horatio Allen* (New York, 1856), p. 14.

82. Porter, *Engineering Reminiscences*, p. 65. See also *The Scientific American*, new series, I (3 September 1859): 149; II (7 April 1860): 78; III (6 October 1860): 234. For fire engines the 7 April 1860 issue of *The Scientific American* of a Novelty-built engine. For sugar machinery see Albion, *The Rise of New York Port*, p. 178.

83. Clark Reynolds, "The Great Experiment; Hunter's Horizontal Wheel," *American Neptune* XXIV (January 1964): 6-7.

84. *The Scientific American*, new series, II (11 March 1860): 79.

85. Dayton, *Steamboat Days*, p. 383.

86. "The Novelty Works," in *Harper's New Monthly Magazine* II (May 1851): 721-34. See also Albion, *The Rise of New York Port*, pp. 150-51; Tyler, *Steam Conquers the Atlantic*, p. 179; Bishop, *American Manufactures* III:127; *The Scientific American* IX (17 December 1853): 110. A British Parliamentary committee investigating manufacturing in the U.S. visited the Novelty works and reported they "did not see any thing new to them, or any machinery not used in similar works in Great Britain." *The American System of Manufactures*, ed., Nathan Rosenberg (Edinburgh, 1969), p. 105. Benjamin F. Isherwood, later engineer in chief of the navy, learned about marine engines while he was employed at the Novelty works in the 1840s. Edward William Sloan III, *Benjamin Franklin Isherwood, Naval Engineer* (Annapolis, 1965), p. 9. John Rogers, well-known nineteenth-century sculptor was employed at Novelty, 1852-1853. See David H. Wallace, *John Rogers; the People's Scuptor* (Middleton, Conn., 1967).

87. John H. Morrison, *History of New York Ship Yards* (New York, 1909), p. 150.

situation, and more than likely saved it from collapsing during the country's economic crisis of the late 1850s.

Novelty, like so many industrial concerns in the United States, was affected by the 1857 financial panic. A statement in an R. G. Dun report for September 1857 said, "Novelty Works failed on Saturday"; but another report in October commented that "the Company will continue reliable . . . so long as they receive the support of Brown, Brothers & Company under whose supervision the Company is conducted." An 1859 report stated that the "Company since its reorganization has had to contend [with] . . . strong opposition and a depressed condition of commerce and has consequently been obliged to take work at very low rates. It is supposed to have held its own." In 1860 R. G. Dun mentioned that the company had had moderate business building fire engines and "work for the Russian Government." The report added that the firm had "made no money for some time," and "paid no dividends."[88] *The Scientific American* in its December 1860 issue, agreed with Dun: "The Novelty Iron Works and the Morgan Iron Works are both working at present on short time, viz. nine hours, by reason of the financial embarrassment now obtaining in commercial circles and not from any lack of work."[89] Less than three weeks before Fort Sumter was fired upon and Pres. Abraham Lincoln's call for troops, Novelty was still not working to capacity. According to *The Scientific American,*

> At present they employ 600 men . . . there are now going forward two beam engines . . . for the Norwich and Stonington route; one marine beam engine . . . for the Pacific Mail Steamship Company; some quartz rock-crushing machinery for South America; an iron stern-wheel boat, fitted with two horizontal high-pressure engines and boilers; and hydraulic pumps and presses for a fish oil factory. . . . Working time at present, nine hours per day.[90]

The war would change Novelty's condition as it would other business firms throughout the country.

No New York City establishment profited more than did the Delamater Iron Works, which built much of the *Monitor*'s machinery. Delamater, originally known as the Phoenix Foundry, was established in 1835 by James Cunningham.[91] From its beginning the company specialized in fabricating marine machinery, achieving some prominence because of a unique valve system that Cunningham developed. Cornelius Delamater joined the company at age sixteen as a clerk. In 1842 the Phoenix works was purchased by Delamater and Peter Hogg, one of the foundry's draftsmen and engineers.[92] The company's name was changed to Hogg & Delamater.

Three years before Delamater and Hogg assumed control of the ironworks, John Ericsson, a young Swedish inventor, contracted with Cunningham to do some work for him. Ericsson met Cornelius Delamater at the foundry, and a friendship and business relationship developed which would last throughout their lives. Delamater became Ericsson's closest friend. Ericsson constantly wrote to Cornelius, whom he called "Harry." "A happy new year to you my old and true friend," Ericsson wrote to "Harry" Delamater on 2 January 1868.[93]

Their business association was just as close. As one writer has pointed out, "rarely . . . did either of them enter upon a business venture without consulting the other."[94] After Delamater became sole owner of the foundry, Ericsson was never charged for using its facilities, tools, and materials. In return Delamater was compensated when the Swede's inventions were successful. Ericsson preferred doing business through Delamater and permitted him to sell an unlimited number of his inventions. Cornelius Delamater "did more work for Captain Ericsson than any one else engaged in the line of engineering," said *The Scientific American* in Delamater's obituary. "It would have been unusual, almost unthinkable, for the Swedish-American engineer to have taken the [*Monitor*] work anywhere else. He had relied on Delamater almost exclusively since the firm agreed to handle the construction of two iron canal boats which were commissioned by Lieutenant Robert F. Stockton in 1839."[95]

Hogg & Delamater expanded substantially in the 1840s. Because of limited space at their original location, the company was moved to a new site in 1849, and

88. New York, 368:440, 441, Dun Col.

89. *The Scientific American*, new series, III (22 December 1860): 408.

90. *The Scientific American*, new series, IV (23 March 1861): 186.

91. Holbrook Fitz John Porter, *The Delamater Iron Works—The Cradle of the Modern Navy* (New York, 1918); Dayton, *Steamboat Days*, pp. 384-85; Bishop, *American Manufactures* III:129-30.

92. Dayton, *Steamboat Days*, p. 384; Porter, *The Delamater Iron Works*, p. 5. For Cornelius Delamater see *D.A.B.* V:211-12; *American Machinist* XII (1899): 7; *Transactions, American Society of Mechanical Engineers* X (October 1888): 386-88.

93. William C. Church, *The Life of John Ericsson* (2 vols., New York, 1911), I:244.

94. Porter, *The Delamater Iron Works*, p. 5; Church, *Ericsson* I:244. An obituary for Delamater said that he "did more work for Captain Ericsson than any one else engaged in the line of engineering." *American Machinist* XII (1889): 7. See also *D.A.B.* V:211.

95. Watts, "Monitor of A New Iron Age," pp. 60-61.

the name changed to Hogg & Delamater Iron Works. A final name change occurred in 1858 when Hogg sold out to Delamater. The establishment until its demise would be known as the Cornelius H. Delamater Iron Works.[96] At the time the Civil War broke out, Delamater was reputed to be the largest marine steam engine manufacturing establishment in the country.[97] It occupied a space "two hundred feet fronting the North River, with a front of six hundred feet on Thirteenth Street, and an equal space on Fourteenth Street as well as additional grounds on the south side of Thirteenth Street. . . . The establishment is furnished with every requisite for building all kinds and varieties of machinery. . . . There have at times been from one thousand to twelve hundred workmen employed here."[98]

J. Leander Bishop, in his history of manufacturing, wrote that "when the whole expense of conducting such Works is taken into account, it seems wonderful that such extensive operations should have been so successfully conducted under the proprietorship of a single individual." In contrast to the other large marine machinery works operated by partnerships or corporations, "the Delamater Iron Works have achieved distinguished triumph in engineering under the direction of a single proprietor possessing a mind of great executive and financial ability."[99]

An R. G. Dun report stated in 1854 that Delamater had "been doing a large business and made money, considered rich." In 1857, the year of the financial panic, Dun mentioned that Delamater's business "is good and profitable."[100] The company apparently was not badly hurt by the recession that hit the country in the late fifties.

From marine machinery, the company's work expanded as contracts were obtained to cast pipe, build machinery (boilers, engines, tanks, etc.) for sugar refineries and waterworks, fire engines, and stationary engines for a variety of uses from running mill machines to foghorns. Delamater imported large tools from England and manufactured others. Among the most successful products were fire engines or "Ericsson pumpers." Ericsson also invented a hot air or "caloric" engine that was manufactured and sold in large numbers by Delamater.[101]

The company's reputation was built on marine machinery, particularly steam engines and propellers. Machinery was fabricated for paddle-wheelers, but it was in propeller-driven craft that the company specialized. Undoubtedly, this was because of the unique relationship between Ericsson and Delamater. Even before Delamater became owner, however, the company was manufacturing the machinery for screw-propelled vessels. In 1837 Ericsson built a screw-propelled steamer in England. Five years later, after having emigrated to the United States, he was employed by the Navy Department as superintendent for the construction of *Princeton,* the first screw-propelled warship. Although the hull and most of the machinery were built at Philadelphia, the Phoenix Foundry fabricated her boilers, propeller, and centrifugal blower.[102]

It is possible that *Clarion,* the first oceangoing propeller-driven craft in the U.S., received her machinery from the Phoenix Foundry. Originally a sailing vessel, she was converted to twin screws in 1840 by Ericsson.[103] In 1844, two steamers with screw propellers were launched, both with Hogg & Delamater-built machinery. *Midas* was a twin-screw vessel built for Robert B. Forbes, a well-known shipmaster, shipowner, and strong advocate of propeller-driven craft.[104] She was followed by *Marmora,* also with Ericsson-designed, Hogg & Delamater-built machinery. From the mid-

96. A Dun report dated 23 June 1855 said: "Have not learned upon what terms [Delamater] purchased out his partner, but he is believed to have strength to go on alone. . . . Those who know him have great confidence in his integrity and reliability." New York, 316a:180, Dun Col.

97. James P. Baughman, *The Mallorys of Mystic* (Middletown, Conn., 1972), p. 117.

98. Bishop, *American Manufactures* III:130.

99. Bishop, *American Manufactures* III:132.

100. New York, 316a:185, Dun Col.

101. Porter, *The Delamater Iron Works,* pp. 6-7; Ericsson to Sargent, 23 April 1845, Ericsson Papers, American Swedish History Museum; *The Scientific American,* new series, V (6 July 1861).

102. Lee M. Pearson, "The *Princeton* and the 'Peacemaker': A Study in Nineteenth-Century Naval Research and the Development Procedures," *Technology and Culture* VII (Spring 1966): 164. Frank M. Bennett in *The Steam Navy of the United States* (Pittsburgh, 1896), p. 62, states that the machinery was built by Merrick & Towne. Church in his biography of Ericsson gives Hogg and Delamater credit for building it (I:226). So does Robert MacFarlane, editor of *The Scientific American.* See his *History of Propellers and Steam Navigation* (New York, 1851), pp. 116-17. Ericsson had difficulty collecting compensation from the Navy Department and did not seek government work again until 1854 when he proposed to design machinery for five auxiliary steamers; the work to be done at Hogg & Delamater. He did not get the contract. Ericsson to secretary of the navy, 30 August 1854, Ericsson Papers, American Swedish History Museum. For Ericsson's problems with the Navy Department see Church, *Ericsson* I:140-54.

103. Nevitt, *American Steamships,* pp. 83-84; Church, *Ericsson* I:109-10.

104. Robert B. Forbes, *Personal Reminiscences* (2d ed., Boston, 1882), pp. 208-10; Nevitt, *American Steamships,* p. 86.

forties through the Civil War, Hogg & Delamater dominated industry along the Atlantic coast in the construction of machinery for screw-propelled craft.[105]

Delamater benefited from a close association with a yachting friend, Charles Henry Mallory, a Mystic shipbuilder and shipowner. Early in 1860 Mallory created a shipping company to run a line of steamers between New York and the Gulf ports. He built a number of wooden steamers and contracted with Delamater to provide their machinery. This was the beginning of a business association that would last a number of years. As Mallory's biographer wrote, "For machinery, the Mallory yards depended primarily on the Delamater Iron Works . . . the Reliance Machine Company, and the Mystic Iron Works. Delamater filled the bulk of Mallory's order for engines, boilers, shafts, pumps, and windlasses."[106]

In 1852 Ericsson designed a ship named after himself which was powered by a caloric engine, considered revolutionary by the inventor and many of his contemporaries. The vessel's machinery, which as usual was built by Hogg & Delamater, was designed to test Ericsson's idea of driving a ship by heated air instead of steam. Ericsson and Delamater also backed the ship financially, expecting the ship to be so successful that shipowners worldwide would adopt his caloric engine. In 1854 a Dun statement noted that Hogg & Delamater "have invested a large amount of money in the 'Ericsson ship experiment.' If it is successful they will be very rich, and if it is not they will be hard run."[107] The ship's engines were considered a failure, her speed approximately half of what was anticipated. Nevertheless, the company was not badly hurt financially. This was partly because John B. Kitching, a wealthy New Yorker and one of Ericsson's backers, absorbed much of the loss, and perhaps more important, the caloric engine proved quite successful for pumping water, driving printing presses, and running a variety of small machines. In later years, Delamater built many small caloric engines for nonmarine use.[108]

Delamater also became involved in the construction of iron vessels. As mentioned earlier two iron barges were built for the Delaware and Raritan Canal Company in 1840. The works provided machinery for *Iron Witch* launched in 1846, a side-wheeler built for the Hudson River which Dayton called "a freak of the forties."[109] Although *Iron Witch* was a failure, *Matanzas* and *North Carolina*, iron screw-propellers built in 1859-1860, were successful. *Matanzas* would be used in the West India trade until destroyed by fire in 1868. *North Carolina* would become a Confederate blockade runner during the Civil War.[110] Delamater had acquired considerable experience in fabricating machinery for iron-hulled vessels by the time *Monitor* was contracted for. The same, however, was not true of the Clute Brothers Foundry.

Outside of New York City, only one other establishment specializing in steam engine construction was involved in building *Monitor*. In 1835 the firm of Clute & Bailey was started in Schenectady, New York, by P. I. Clute. Seven years later, Cadwallader C. Clute bought out Bailey and the firm became P. I. Clute and Sons.

In 1849 the elder Clute retired and Cadwallader C. Clute was joined by a brother to form Clute Brothers. The establishment was continued under that name for more than thirty years. The foundry manufactured tools, boilers, and steam and caloric engines, both stationary and marine.[111] Machinery was built for Erie Canal boats. Little is known about the company's business activities until the 1850s when they started building Ericsson's caloric engines. Probably this is the reason why the establishment was chosen as one of the *Monitor* subcontractors.[112]

105. A large number of Ericsson-designed propellers were built by Great Lakes firms. For many of the vessels that Hogg & Delamater provided machinery, see Dayton, *Steamboat Days;* Forbes, *Reminiscences;* Nevitt, *American Steamships; The Scientific American,* new series, IV (12 January 1861): 28; Main, *The Progress of Marine Engineering,* p. 33.

106. Baughman, *The Mallorys of Mystic,* pp. 102-3. Baughman wrote, "For machinery, the Mallory yard depended primarily on the Delamater Iron Works [and two local works]. . . . Delamater filled the bulk of Mallory's order for engines, boilers, shafts, pumps, and winches," p. 117. See also *The Scientific American,* new series, II (25 February 1860): 131; (23 March 1860): 182.

107. New York, 316a:180, Dun Col.

108. John B. Kitching, *Ericsson's Caloric Engine* (New York, 1859); Eugene S. Ferguson, "John Ericsson and the Age of Caloric," *Bulletin No. 298: Contributions from the Museum of History and Technology* (Washington, D.C., 1963); *Ericsson's Contributions to the Centennial Exhibition* (New York, 1876); *Articles Descriptive of the Caloric Ship Ericsson and of her Trial Excusion of January 19, 1853, Taken from the Daily Journals of the City of New York* (Washington, D.C., 1853).

109. Dayton, *Steamboat Days,* p. 56.

110. *The Scientific American,* new series, I (8 October 1859): 255; *Journal of the Franklin Institute,* 1860, p. 185.

111. Myron S. Westover, ed., *Schenectady Past and Present* (Strasburg, Va., 1931), p. 113; *Schenectady City and County Directory for 1862* (Schenectady, 1862), p. 36. A copy of this directory is in the Library of Congress. Joel H. Monroe, *Schenectady Ancient and Modern* (Geneva, N.Y., 1914), pp. 247-48.

112. Kitching, *Ericsson's Caloric Engine,* p. 9.

Continental Iron Works was the most recently established firm that built the *Monitor*. Thomas Fitch Rowland was the company's owner in 1861. Rowland was born in New Haven, Connecticut, in 1831.[113] At the age of thirteen he began work in his father's gristmill and a few years later was employed in the machine shop of the New York and New Haven Railroad. He first became involved in the maritime industries in 1850 when he received an appointment as an engineer on the steamboat *Connecticut*. Two years later he obtained a position with the Allaire Iron Works, one of the largest builders of marine steam machinery in New York City. Rowland worked for four years in the machine shop and "drawing room" and then was appointed superintendent. He supervised the construction and installation of machinery for several vessels, including *Harriet Lane*, before leaving Allaire to join Samuel Sneeden's shipyard as engineer. Sneeden's shipyard, located in Brooklyn, specialized in the construction of small wooden vessels. In 1859 Sneeden contracted to build an iron steamer for a New Orleans businessman to run on Lake Pontchartrain. He had no experience in iron ship construction and hired Rowland as his engineer and superintendent. Rowland designed the ship, including her hull, "constructed in the same manner, substantially, as a steam boiler, with a single thickness of plates of iron riveted together where they lap at the edges."[114]

Rowland and Sneeden's subsequent relationship is unclear, as are the origins of the Continental Iron Works. One account says that Rowland, in association with Sneeden, established a business at Greenpoint. Another states that he took over the Sneeden shipyard in April 1859. Fred Irving Dayton, however, mentions Sneeden and Rowland as partners in 1861. A fourth source refers to the two as partners in the Continental Iron Works, "a concern which did other types of iron construction."[115] The most logical explanation is that Sneeden and Rowland became partners at some time after Rowland joined the firm and continued this association until 1861. In 1860 they created the Continental Iron Works, which absorbed the old shipyard. Their first important contract was with the New York Water Board to construct "a wrought [iron] tube seven and a half feet in diameter and one and a quarter mile in length to be connected to a bridge over the Harlem river," linking the Croton Aqueduct to a reservoir in Central Park.[116]

The partners received a contract in 1861 to build two steamboats for the Norwich & New York Transportation Company. The first one, *City of Boston*, was launched in 1861, and the second, *City of New York*, the following year. They were large vessels, more than three hundred feet in length, and according to J. Scott Russell, a well-known English naval architect and designer of *Great Eastern*, were "remarkable specimens of American naval architecture."[117]

By the time *City of New York* was completed, the Civil War was in its second year, and the Continental Iron Works along with the other *Monitor* companies were deeply involved in government work.

Novelty Iron Works was the first of these companies to receive a contract. The navy's engineer-in-chief, Benjamin F. Isherwood, had worked there early in his career and had high regard for the firm. Shortly before the Civil War Isherwood designed the machinery for two Russian gunboats which were constructed at Novelty under his direction.[118] Shortly after the conflict began, the navy decided to build small wooden gunboats that could be used for close inshore work in the shallow southern waters. Isherwood recommended that the Russian gunboat design be adopted, and that Novelty be awarded a contract to build them. The navy agreed and the New York City firm received a contract to build the machinery for four of them. They were completed in ninety days, earning for that class of vessels the name "ninety day gunboats."[119]

Throughout the summer and early fall of 1861,

113. For biographical sketches of Rowland see the *D.A.B.; Harper's Weekly* VI (6 September 1862): 1; *The Nautical Gazette*, 13 January 1875. Although trained as an engineer, Rowland called himself a shipbuilder. See the *Brooklyn City Directory for the Year ending May 1st, 1863* (1863), p. 375. A copy of this directory is located in the Library of Congress.

114. In April 1861 the *Harriet Lane* was the vessel ordered to carry supplies to Fort Sumter in Charleston, South Carolina. This led to the firing on the fort by Southerners and the beginning of the Civil War. For a detailed description of the vessel, including drawings of the hull, see *The Scientific American*, new series, I (8 October 1859): 242. For the Sneeden yard see "The Shipbuilding Industry in Brooklyn," *Brooklyn Life* LIX (26 April 1919): 141; Harold C. Syrett, *The City of Brooklyn, 1865-1898* (New York, 1968), pp. 15-16.

115. Syrett, *The City of Brooklyn*, pp. 15-16. See also Dayton, *Steamboat Days*, p. 165, and *Harper's Weekly* VI (6 September 1862): 1.

116. Bishop, *American Manufactures* III: 132-33.

117. Dayton, *Steamboat Days*, p. 166.

118. Sloan, *Isherwood*, p. 30.

119. Ibid., pp. 30-31; Porter, *Engineering Reminiscences*, p. 60. Bennett in *The Steam Navy of the United States* contradicts himself. On page 4 he writes that Novelty built four, but in his list of vessels in Appendix B

Novelty was occupied with the gunboats and machinery for several steamers, including the Pacific Mail steamship, *Constitution*.[120] Novelty sought no additional government work until Ericsson approached the company with the proposition to construct *Monitor*'s turret. R. G. Dun reported in October 1861 that "they [Novelty] have recently had increased work and employed a good many hands."[121] Presumably, this was a result of the *Monitor* work that started that month.

Novelty's neighbor on the East River, the Cornelius Delamater Iron Works, spent the early months of the war completing the steamships for Mallory. In July 1861 Delamater journeyed to Washington, D.C., where he conferred with Secretary of the Navy Gideon Welles. He informed Ericsson, "I am treated well . . . yet I have no expectation of any contract or immediate good to result to me or to us. . . ."[122] According to a history of the company, Delamater offered to the government "such work as might be needed, but nothing was forthcoming until the *Monitor*."[123]

The same was not true of Continental Iron Works on Long Island and its owner, Thomas Rowland. Young Rowland (thirty-one years old) was "full of energy and enterprise, anxious to identify himself with government work." As soon as the war started, Rowland endeavored to obtain government contracts. He was awarded one by the navy to build gun carriages and became a subcontractor to manufacture wrought iron beds for thirteen-inch mortars. These were later installed on schooners and used by David Dixon Porter in an attack against the forts guarding New Orleans. The navy also engaged the company to fit out merchant vessels purchased for war service.[124]

In May 1861 Rowland travelled to Washington with a model and proposal for an ironclad warship. The proposed vessel was to be a twin-screw ironclad of approximately 750 tons, armored with three layers of 1 ¼-inch iron, backed by iron bars laid parallel to each other. Two diamond-shaped "gun houses" were initially planned, but in a modified proposal submitted later, they were replaced by two revolving turrets. A board of naval officers considering various proposals rejected Rowland's: "It would not bear the weight and provide stability."[125]

The proposal had been signed by Charles W. Whitney and Rowland. Whitney was the New York agent for H. Abbott & Sons of Baltimore. Abbott may well have agreed to provide the iron plating for the vessel. Rowland withdrew from the project after the board's rejection, but Whitney would later get a contract for constructing an armored vessel which was named *Keokuk*. It has been suggested that it was after his proposal was turned down that Rowland agreed to subcontract for *Monitor*'s hull.[126]

John F. Winslow, representing the Albany and Rensselaer ironworks of Troy, also hurried to Washington eager to secure war contracts. In September 1861, he wrote that "we have . . . propositions before the War and Navy Departments and with attention, we shall secure a fair proportion of what is wanted." Winslow, as Ericsson would later recognize, was well connected in Washington. He was a political ally of Secretary of State William Henry Seward and one of New York's representatives, Erastus Corning. Winslow contracted with the War Department to furnish railroad equipment and even a few cannon.[127] Two experimental rifled guns were cast out of steel, or what *The Scientific American* called "semi-steel." Although the magazine claimed that the firing tests conducted at West Point were suc-

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he lists six with machinery provided by Novelty. For a brief history and statistics of these vessels see the appropriate volumes in the *Dictionary of American Fighting Ships* (Washington, D.C., 1959). See also *The Scientific American*, new series, V (20 July 1861): 54; (11 October 1861): 192; (19 October 1861): 250. Drawings of one of the gunboats with machinery under construction can be found in *Harper's Weekly*, 31 August 1861.

120. *The Scientific American*, new series, V (17 August 1861): 106.

121. New York, 368:441, Dun Col.

122. Quoted in Church, *Ericsson* I:242. For work during the spring and summer of 1861 see *Journal of the Franklin Institute*, September 1861, p. 202.

123. Porter, *The Delamater Iron Works*, p. 8.

124. Charles L. Dufour, *The Night the War Was Lost* (Garden City, 1960), pp. 150-53; Robert V. Bruce, *Lincoln and the Tools of War* (Indianapolis, 1956), pp. 157-62; Bishop, *American Manufactures* III:133. For the quote on Rowland see Church, *Ericsson* I:258.

125. For a detailed description of the proposed vessel see James P. Baxter, III, *The Introduction of the Ironclad Warship* (Cambridge, 1933), pp. 250-52; "Report of Board to examine plans of iron-clad vessels, under Act of August 3, 1861" in *Report of the Secretary of the Navy in Relation to Armored Vessels* (Washington, D.C., 1864), p. 87.

126. Baxter, *Introduction of the Ironclad Warship*, p. 252. See also Church, *Ericsson* I: 258-59, for a different version. In a "History of the Continental Iron Works," A. R. Whitney is mentioned as one who "furnished transportation for the iron, and later became a dealer in iron, and furnished large amounts of metal to Mr. Rowland for later vessels." Copy of "History" provided the writer by E. W. Peterkin, 29 September 1985.

127. Quoted in Neu, *Corning*, p. 53. John Niven, *Gideon Welles, Lincoln's Secretary of the Navy* (New York, 1973), p. 367.

cessful, apparently no contracts for additional guns were awarded to the Troy works.[128]

Winslow and his Troy partner, John Griswold, were approached by Cornelius Bushnell, a New Haven, Connecticut, businessman, to provide iron for an armored warship that he was proposing to build. Bushnell's vessel, named *Galena,* would receive her iron, including armor plate, from the two Troy establishments. Winslow devised a system of plating which he patented that was applied to *Galena*. In order to eliminate the use of bolts to attach the plate to the wood backing, which he considered to be a serious weakness of European ironclads, he developed a "tongue and groove" system with the plates being attached by rivets to iron "chairs" similar to inverted railroad T-rails.[129] *Galena* and Winslow's armor plan were a failure. The ironclad was badly damaged, with at least eighteen shots penetrating her armor, when she engaged Confederate forts near Richmond in May 1862. As a result of the business relationship with Bushnell, Winslow and Griswold would become involved in the *Monitor* project.

Undoubtedly, other *Monitor* companies sought government contracts. Certainly H. Abbott & Sons did. The firm's size, capabilities, reputation, and proximity to the nation's capital, made it a prime industry to secure government work. Undoubtedly, Holdane & Company did as well. R. G. Dun reported in the spring of 1862 that Holdane has "done good business and made money since the Rebellion broke out."[130] There is no evidence that Clute in Schenectady nor the Niagara Steam Forge Company in Buffalo engaged in government work before becoming *Monitor* subcontractors. According to a recent study of Buffalo, "the Civil War [did] . . . little to alter the commercial orientation of Buffalo's economy. . . . Those industries that did exist at the end of the war—iron foundries, ship builders, clothing manufacturers—produced strictly for the local market."[131]

The story of the *Monitor*'s construction and the contribution by the various companies has frequently been told, and need only be briefly mentioned here.[132] Ericsson, Bushnell, Griswold, and Winslow were all instrumental in getting the proposal for "Ericsson's battery" accepted by the navy and a contract was awarded to the "Battery Associates" on 4 October 1861. Each of the four took a fourth interest in the venture. Initial financial backing was obtained by Griswold and Winslow.[133] Because of the time constraint of one hundred days to complete the ironclad imposed by the contract, the contractors decided to subdivide the work among a number of establishments. They also divided up their responsibilities. Griswold would handle finances; Winslow would obtain the iron including the armor plate; and Ericsson would see that the machinery was built and oversee the vessel's construction.[134]

Ericsson and the contractors for the hull and turret provided Winslow with specifications, drawings, and amount of iron needed, and he in turn either produced it at the Troy facilities or ordered it from H. Abbott & Sons or Holdane & Company. The Troy works manufactured some of the angle and bar iron, spikes and bolts, but because of other commitments, particularly *Galena,* Winslow had to depend upon the other ironworks for much of the iron. Ericsson wanted rolled plates of four inches' thickness for the armor, but Abbott, the only establishment in the country at that time capable of manufacturing them, said that it would take at least two months to modify its facilities to roll iron of that thickness. The navy reluctantly agreed to accept one-inch plate for laminated armor.[135] Abbott

128. *The Scientific American,* new series, IV (8 June 1861): 356; V (7 September 1861): 149; (2 November 1861): 277-78. The November issue included drawings of the gun and targets.

129. *The Scientific American,* new series, V (2 November 1861): 276-77; and 12 April 1862 included detailed descriptions and drawings of Winslow's plating system for the *Galena*. The *Galena* was badly damaged, at least eighteen shots penetrating her armor, when she engaged Confederate forts near Richmond in May 1862. See also Francis B. Wheeler, *John F. Winslow, LL.D. and the* Monitor (Poughkeepsie, N.Y., 1893), p. 21.

130. New York, 323:890a-b, Dun Col.

131. Goldman, *High Hopes,* pp. 124-25.

132. See Baxter, *The Introduction of the Ironclad Warship;* Edward M. Miller, *The U.S.S.* Monitor, *The Ship That Launched the Modern Navy* (Annapolis, 1979).

133. Winslow, and Griswold, and probably Corning, secured the funds locally for the project. Jeanne McHugh, *Alexander Holley and the Makers of Steel* (Baltimore, 1980), pp. 69-70; Neu, *Corning,* pp. 53-55. Copies of the contract are located in the John Ericsson Papers, Library of Congress, and the Griswold Papers.

134. Griswold to Ericsson, 14 October 1861, Ericsson Papers, American Swedish History Museum.

135. Ericsson to Winslow, 8 October 1861; C. W. Whitney to Griswold, 22 October 1861; 8 November 1861; Rowland to Winslow, 19 October, 4 November 1861, Griswold Papers; Winslow to Ericsson, 20 September, 9, 20 October 1861, Ericsson Papers, American Swedish History Museum; Ericsson to Smith, 8 October 1861, Records of the Office of the Chief of the Bureau, Entry 5, sec. 7, Miscellaneous Correspondence, 1842-1885, Letters Received, RG71, Records of the Bureau of Yards and Docks, National Archives, hereinafter cited as Entry 5, RG71; Baxter, *Introduction of the Ironclad Warship,* p. 266.

and the Albany Iron Works manufactured the armor plate, the first rolled in the United States.[136]

Holdane & Company was not a manufacturer but an iron dealer in New York City. This firm contracted to provide a large quantity of angle iron for frames, bulkheads, etc., along with 125 tons of armor plate. Apparently Holdane had difficulty in supplying it. On 12 November Ericsson wrote to Griswold complaining about the nonreceipt of iron from Holdane: "The 1/2 inch engine bulkhead iron Mr. Holdane has been promising from day to day—not a sheet had made its appearance yesterday." He added, "I feel sometimes in despair on account of the want of material." In a postscript he wrote, "Mr. H. has also at last given me the names of the parties who manufactured the iron." Earlier he had mentioned that "strange to say I am not permitted to know where the plate is being rolled."[137]

Ericsson negotiated for the machinery and for the construction of the turret and vessel itself. Delamater, not surprisingly, was to manufacture the main engines, boilers, propeller, and other machinery parts. He contacted Clute & Brothers, a firm that he was familiar with because of their success in producing his caloric engines. On 6 November he accepted an offer from Clute to build the turret engines, gun carriages, anchor hoister (windlass), and engine room grates.[138]

Ericsson selected the Novelty Iron Works to construct the turret. It was evidently the only establishment in New York City with powerful steam-operated presses and other facilities needed to bend the iron plates.

The Continental Iron Works was chosen to actually build the vessel.[139] Ericsson never said why Continental was selected. He wrote in an account of *Monitor* published after the war that "I divided the work among three leading mechanical establishments," presumably referring to Novelty, Delamater, and Continental.[140] Geographical proximity may have been a factor in the choice. "All three were readily accessible for the engineer to personally supervise and direct the activities at each location. As the three major elements of the battery were to be constructed separately, Ericsson felt that their successful assimilation would depend heavily upon his maximum supervision and coordination."[141]

Undoubtedly their relative closeness was an attractive feature, but more important was Rowland's experience in building iron vessels, and the facilities available at Continental. As one writer noted, "Rowland's experience and shipbuilding facilities were well suited to Ericsson's needs."[142] According to Church, Rowland approached Ericsson about it. Regardless, the shipbuilder was well known to the inventor and his yard was a logical site to construct and launch *Monitor*.

Monitor was completed early in 1862 and after sea trials in February left under tow on 6 March to join the blockading squadrons. The warship arrived in Hampton Roads in time to challenge the Confederate ironclad *Virginia* in one of the more dramatic naval engagements in American history. *Monitor*'s apparent success in this battle produced such an intense enthusiasm in the North that a "monitor" craze swept the Union. Three weeks after the action ten improved Ericsson monitors were contracted—the *Passaic* class—which would see more service than any other class of monitor. Until the end of the war the navy would concentrate on monitor construction. Of the forty armored vessels laid down by the Union during the war, thirty-five were of the monitor type.

Ericsson profited from this situation not only in the acclaim for his design, but in the award of contracts to construct six of the improved monitors. He immediately subcontracted with several of the same firms that built *Monitor*.[143] Continental Iron Works constructed the hulls and turrets for three, *Passaic, Montauk,* and *Catskill.* Delamater provided much of the machinery. As with *Monitor,* the Troy interests handled the finances. On 14 March 1862, six days after the Hampton Roads action, Winslow wrote Corning, "We have closed for 6 Boats on the plan of the *Monitor* for $400,000

136. Ericsson to Smith, 19 October 1861, Entry 5, RG71; Wheeler, *Winslow*, p. 29; Rezneck, "Winslow," p. 89. Winslow contracted with Delaney for the port stoppers.

137. 12 November 1861, Holdane to Griswold, 19 October 1861, Griswold Papers.

138. Ericsson to Clute, 6 November 1861, Griswold Papers; *The Scientific American*, new series, V (11 November 1861): 331.

139. A copy of the contract dated 25 October 1861 is in the Griswold Papers.

140. John Ericsson, "The Building of the *Monitor*," *Battles and Leaders of the Civil War*, Robert U. Johnson and Clarence C. Buel, eds. (4 vols., New York, 1884-1888), I:731.

141. Watts, "*Monitor* of a New Iron Age," p. 59.

142. Ernest W. Peterkin, "Building a Behemoth," *Civil War Times Illustrated* XX (July 1981): 17.

143. Ericsson tried a kind of mass production method with these vessels. "They would be alike in every particular. For instance the main frames of the engines of 5 of these vessels have been cast from one pattern at the Delamater Iron Works. The turret engines . . . have been cast from one pattern." Ericsson to Bennett, 27 June 1862, Ericsson Papers, American Swedish History Museum.

each—they are to be a trifle larger in size—this will do."[144]

The armor plate was supplied by Abbott & Sons. Possibly other iron works, including those in Troy, provided some of it, although it is more likely that the New York firms furnished the other iron materials.[145]

Evidently Clute was a subcontractor again. There is correspondence in the Ericsson papers located in the New York Historical Society and the American Swedish Historical Foundation between the inventor and the Schenectady works concerning blowers and other miscellaneous parts but specific vessels are not mentioned. In November 1862 Clute Brothers wrote Capt. Albin C. Stimers, who had been appointed "General Inspector of Iron Clad Steamers," concerning a contract to provide turrets for a later class of monitors. In the letter the company asked "if the drawings for Gun Carriages for 11-inch guns which we examined at Capt. Ericsson's are the ones to be used." Clute Brothers definitely received a contract to build the anchor hoister machinery for the sea-going monitor *Dictator*.[146]

In addition to the *Passaic*'s, Ericsson received a contract for two large oceangoing monitors which were named *Dictator* and *Puritan*. *Dictator*'s hull and machinery were subcontracted to Delamater. *Dictator* was commissioned in November 1864 but mechanical difficulties prevented her from participating in the final naval operations of the war. *Puritan*'s hull was subcontracted to Continental Iron Works, and, although launched in 1864, was never commissioned.[147] Secretary of the Navy Gideon Welles wrote in his diary that "the contractors for the *Puritan* and the *Dictator* are in trouble and embarrassed," apparently because they were unable to meet their schedule for completing the vessels. Nevertheless, the secretary recommended that they be fully paid to keep them from being ruined.[148]

Thomas Rowland, the young and energetic president of the Continental Iron Works, secured a substantial amount of work for his establishment during the war. Ericsson was clearly pleased with Continental's work on *Monitor*, awarding the firm contracts to build not only the hulls and turrets for three "improved monitors" (*Passaic*, *Montauk*, and *Catskill*), but contracts for the turrets of three others (*Sangamon*, *Lehigh*, and *Patapsco*). The company would later receive a contract to build the hull and turrets for *Onondaga*, the first double-turreted monitor, and finally an agreement to construct the "light-draft" monitor *Cohoes*.[149]

Continental's substantial turret contracts resulted in Rowland designing and building special machinery, including a "double planer for armor and turret plates" described in *The Scientific American*. In another issue the editor reported on another unique piece of turret machinery developed by Rowland: "the holes [on the plates] . . . are . . . drilled out by means of an ordinary drilling machine, ingeniously arranged upon a long piece of timber, and operated by a small engine. This timber has a bearing in its center, which works around a central shaft in the turret, and by this arrangement all the holes are easily run through, first with a drill, and then finished with a reamer. The use of this machine despenses with the labor of no less than seventy-five men; it was not employed in the construction of the *Monitor*." An article in *Harper's New Monthly Magazine* mentioned that Continental was heating plates before bending them, "so the powerful hydraulic press [used by Novelty] is despensed with."[150]

Rowland impressed not only Ericsson, but those who visited his plant. A writer for *Harper's New Monthly*

144. Neu, *Corning*, p. 55.

145. 5 November 1862 in Court of Claims of the United States, *Report of Navy Department Documents Relating to the Harbor and River Monitors Manhattan, Mahopac, and Tecumseh* (Washington, D.C., 1912), p. 1029, hereinafter cited as *Documents Relating to the Harbor and River Monitors*. See additional correspondence, *Documents Relating to the Harbor and River Monitors*, pp. 1029-31. For Abbott see Olson, *Baltimore*, p. 145; Bill of H. Abbott for deck plate, 16 March 1863, in *Documents Relating to the Harbor and River Monitors*, p. 1519; Scharf, *Chronicles of Baltimore*, pp. 490-91; Bishop, *American Manufactures* III:116; *The Scientific American*, new series, VII (8 November 1862): 298. For Holdane see New York, 323:G890a, Dun Col. Clute may have provided parts.

146. Ericsson to Clute Brothers, 15 January 1865, Ericsson Papers, American Swedish History Museum.

147. For contracts see Entry 231, Records of the United States General Accounting Office, RG231, National Archives. See *Dictionary of American Naval Fighting Ships* III:762-64 for data. Church's *Ericsson* discusses the two vessels but ignores their failings. Robert Johnson in *Rear Admiral John Rodgers, 1812-1882* (Annapolis, 1967), pp. 261-79, is far more objective, particularly of the *Dictator* which Rodgers commanded. See also *The Scientific American*, new series, VIII (17 January 1863): 41; and IX (2 April 1864): 217. Porter in *The Delamater Iron Works* is in error when he gives Delamater credit for building *Puritan*'s machinery (p. 12).

148. Gideon Welles, *Diary of Gideon Welles*, ed. Howard K. Beale (3 vols., New York, 1960), II:201-2, 207.

149. Bishop, *American Manufactures* III:133; *Harper's Weekly*, 6 September 1862. *The Scientific American*, new series, VIII (23 May 1863): 330; *Documents Relating to the River and Harbor Monitor*, pp. 1474, 1529.

150. *Harper's New Monthly Magazine* XXV (September 1862): 443; *The Scientific American*, new series, VII (8 November 1862): 298; (25 October 1862): 264.

Magazine admired his administrative skills and energy. *The Scientific American*'s editor called him "ubiquitous." "He is inquired for on every side, overseeing the most minute details, he seems to accomplish in his own person the work of two or three men."[151] The navy, however, was not as complimentary. On the basis of a report from Rear Adm. Francis H. Gregory, head of the "Monitor Bureau," Secretary Welles wrote on 26 September 1862, "Mr. Rowland, the contractor, seems to have great responsibility and he ought to throw his whole energies into the work, giving daily the influence of his presence among the workmen, especially in the case of the *Catskill* so far behind."[152]

By the fall of 1862, Continental Iron Works occupied between seven and eight acres; according to *The Scientific American,* it was so crowded with buildings, shops, stacks of lumber, iron, etc., that "locomotion [by the workers] is both difficult and dangerous." The number of workmen employed by Rowland varied from five hundred to more than a thousand during the war.[153]

In September 1862 *The Scientific American* boasted of the "immense iron-clad fleet in the course of construction" in New York City. The city had been a center of shipbuilding for many years, yet the local papers were aware that more warships, particularly the new monitor types, were being built in their community than elsewhere in the country. The evidence was visible, including the prosperity that it engendered. On 17 March 1863, the Brooklyn *Union* reported on the "unabated prosperity of the ship building interest in that Long Island city." The value of the number of warships and commercial vessels under construction "was upward of ten millions of dollars, and the number of persons employed thereon, is between two and three thousand."

Not all were pleased with New York City's good fortune. Charles H. Cramp, who owned extensive shipbuilding facilities in Philadelphia, in his memoirs wrote of a New York "ring," presumably involving Admiral Gregory and other naval officers responsible for warship construction in the country, as well as influential civilians. He accused the "ring" of preventing "the construction of a type of iron clad vessel except monitors," and of concentrating warship construction, especially armored vessels, in New York City.[154] Ericsson did favor New York and Boston contractors, but it is equally true that New York City along with Philadelphia were the nation's centers for iron ship construction before the war.[155] The New York interests, particularly Ericsson, also had political support in Washington. During the first year of the war Erastus Corning had represented one New York district until replaced by Griswold. The latter would be appointed to the Naval Affairs Committee. The business relationship between Ericsson and Griswold, which began with the *Monitor* negotiations, continued throughout the war. "Griswold acted as Ericsson's Washington agent and spent much time in the Navy Department promoting the inventor's interests whenever possible."[156] Nevertheless, there is no evidence that a "New York City ring" existed. Of the twenty-seven monitors contracted for before 1863, twenty were built outside New York City, and naval officers in Washington, particularly the assistant secretary of the navy, Capt. Gustavus Fox, were most responsible for concentrating on the monitor type.

The *Monitor* companies understandably did not depend entirely upon Ericsson for government contractual work. Continental Iron Works built the hull and machinery for the iron side-wheeler *Muscoota;* Delamater and Clute Brothers provided miscellaneous machinery parts for a number of Union vessels other than monitors; and Abbott & Sons rolled plate for the majority of armored vessels built in the northern states.[157]

Abbott received a contract from the War Department shortly after completing *Monitor*'s plate to fabricate thirty mortar beds for use on the western rivers. This establishment also manufactured mortar beds for David Dixon Porter's flotilla that bombarded the forts guarding New Orleans. In 1863 Abbott completed another order for 250,000 pounds of rolled iron in forty-eight hours and received a letter of commendation from the secretary of the navy for this achievement.[158]

151. *The Scientific American*, new series, VII (8 November 1862): 298.

152. Letter in *Documents Relating to the Harbor and River Monitors*, p. 1520.

153. *The Scientific American*, new series, VII (27 September 1862): 201; (8 November 1862): 297; (11 October 1862): 234; (2 August 1862): 73. See also Henry R. Stiles, *The . . . History and Commercial and Industrial Record of the County of Kings and the City of Brooklyn, N.Y., from 1683 to 1884* (2 vols., New York, 1884), II:498.

154. Augustus C. Buell, *The Memoirs of Charles H. Cramp* (Philadelphia, 1906), pp. 72-85.

155. Dana M. Wegner, Alban C. Stimers and the Office of the General Inspector General of Ironclads, 1862-1864, M.A. thesis, State University of New York, Oneonta, 1979, p. 29.

156. Wegner, "Alban C. Stimers," p. 47.

157. *Documents Relating to the Harbor and River Monitors*, p. 1529.

158. Scharf, *Chronicles of Baltimore*, p. 490; *Sunday Sun Magazine* (Baltimore), 26 July 1953. For the mortar beds see Nevins, *Hewitt*, pp.

There is no evidence that the Niagara Steam Forge subcontracted with Ericsson or solicited additional government work after *Monitor*. Despite its geographical isolation from the eastern seaboard and the mainstream of war-related activities, Buffalo's economy expanded during the conflict. By 1865, for example, the city had twenty ironworks in operation. Most of this prosperity, however, was related to the Great Lakes. Shipbuilding on the lakes boomed during the war years and Buffalo was a center of this industry. The first commercial iron ship, the *Merchant*, was built in 1861 in Buffalo. The Niagara Steam Forge made the engine shafts and other parts for many of the new vessels. By 1865 this company employed 120 workers.[159]

Novelty Iron Works, which built *Monitor*'s turret, was the only major subcontractor to no longer work for Ericsson. This was probably because the company was already working on an armored vessel, *Roanoke*, when the contracts for the "improved monitors" and the oceangoing monitors were let. *Roanoke* had been built before the war as a large screw frigate, a sister ship of the *Merrimack*. The navy decided to convert her into an ironclad by cutting the hull down to the gundeck and then plating her with iron armor. It was proposed that she carry four Coles turrets on the center line, but, because of the weight, only three were installed. According to one account, Novelty was selected as the builder, "as no Navy yard could produce . . . heavy armor."[160] Novelty received a contract to provide the iron plate and to build the turrets probably in March 1862, and she was completed and placed in commission approximately a year later.

Roanoke's plate was rolled at another New York ironworks, transported to Novelty where they were drilled and "curved" by using a large "hydraulic press."[161]

Although *Roanoke* was theoretically the most powerful turreted vessel commissioned during the war, she was generally considered a failure. The weight of the three turrets used caused her to roll heavily, even in a slight seaway; her hull was too weak to support them; and her draft was too great to operate in the shallow southern waters. She joined the North Atlantic Blockading Squadron for several months, but most of her service was as a station or guard ship.

Roanoke's completion did not result in Novelty working with Ericsson again, possibly because of other commitments, or because of the use of Coles turrets on *Roanoke*, or possibly because of Horatio Allen's strong ties with two influential naval officers, Alban C. Stimers and Benjamin F. Isherwood, both of whom frequently clashed with Ericsson. Navy Chief Engineer Alban C. Stimers, who was inspector general of ironclads with an office in New York City, even hired a Novelty engineer, Allen's nephew, as his assistant.[162]

Allen's relationship with Benjamin F. Isherwood, engineer-in-chief of the navy, was much closer. Isherwood had served as an apprentice at Novelty in the 1840s and had been instrumental in obtaining for Novelty the contracts to build the ninety-day gunboats and the *Roanoke*. In 1863 Isherwood persuaded the Navy Department to sponsor an investigation of the "value of working steam expansively" with an appropriation from Congress. The chief engineer chose Allen to conduct the experiments, which were carried out at Novelty.[163]

Finally, Novelty built Isherwood-designed machinery for two warships, the monitor *Miantonomoh*, and the screw steamer *Wampanoag*. *Miantonomoh* was one of four, large, double-turreted monitors, two of which carried Ericsson-designed machinery, and two, Isherwood's. After the war *Miantonomoh* would be the first monitor type to cross the Atlantic Ocean. *Wampanoag*, called "Isherwood's masterpiece," was designed to challenge the Confederate cruisers. Carrying Ish-

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202-3; Dufour, *The Night the War Was Lost*, pp. 149-55; Bruce, *Lincoln and the Tools of War*, pp. 156-64; Cooper, Hewitt & Co., to General Ripley, 24 January 1862, *The War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies* (130 vols., Washington, D.C., 1880-1901), ser. III, vol. I, p. 899, hereinafter cited as O.R.A. See also correspondence concerning the monitor beds in O.R.A., ser. III, vol. I, pp. 810, 874, 878, 884, 887. No information has been found to suggest what Abbott provided to receive the commendation.

159. Smith, *History of Buffalo* II:240-41; John T. Norton, et al., *History of Northwestern New York* (3 vols., New York, 1942), I:185.

160. Sloan, *Isherwood*, p. 56.

161. For a detailed description of Novelty's work on the *Roanoke*, including drawings, see *Harper's New Monthly Magazine* XXV (September 1862): 434-42. See also *The Scientific American*, new series, VII (26 July 1862): 57; VI (11 October 1862): 226; VII (6 December 1862): 362; VIII (31 January 1863): 73-74; (4 April 1863): 217; (25 April 1863): 265. For the vessel's history see John D. Alden, "Born Forty Years Too Soon," *American Neptune* XXII (October 1962): 252-63; and Baxter, *Introduction of the Ironclad Warship*, pp. 304-5.

162. Dana Wegner, "Ericsson's High Priest," *Civil War Times Illustrated* XIII (February 1975): 33-34; Wegner, "Alban C. Stimers." Stimers and Ericsson got along generally until early in 1863.

163. Sloan, *Isherwood*, pp. 90-91; *The Scientific American*, new series, X (2 April 1864): 211-12; "A Memorial of Horatio Allen," 1175-76. For Ericsson and Isherwood's relationship see Sloan, *Isherwood*, pp. 143-58.

erwood-designed machinery, Novelty-built, she was remarkably fast, making the unheard-of speed of 17.75 knots on one trial run. She had been laid down in 1863 but was not completed until four years later.[164] Allen's relationship with the Navy Department, especially Isherwood, clearly benefited Novelty. In addition to the various vessels mentioned above, the company built machinery for seven additional warships during the conflict.[165]

Novelty also had the time to build the machinery for two large sea-going armored warships constructed in New York City for the Italian government, several commercial steamers, and even a yacht. Finally, the ironworks continued to manufacture machinery for domestic use, such as paper mills.[166]

In June 1862 R. G. Dun & Co. recorded in a ledger that Novelty has "had considerable good work . . . & have now a contract for iron plating of war steamers." Ten months later *The Scientific American* reported that "at these works we found a large number of engines in all stages of construction." Nine hundred workers were employed, according to the magazine. A year later the company was still heavily involved in marine steam machinery building. Four beam and two single-screw engines for Pacific Mail steamers under construction in New York City, engines and boilers for two revenue cutters, as well as the machinery for the naval vessels, were all in various degrees of construction. Novelty would be busy throughout the war and, according to R. G. Dun, "made money fast."[167]

Novelty was not the only *Monitor* company during the war that was involved in both government and nongovernment work. Delamater continued to build machinery for commercial vessels throughout the conflict. Several engines were constructed for Lake Erie vessels, machinery for a number of vessels engaged in New York and New England coastal and inland trade, and machinery for several vessels, "taken into government service," were produced by the firm. Delamater's business relationship with Mallory, developed before the war, continued with the New York establishment supplying the engines and machinery for the hulls built by the Mystic shipbuilding firm. By the middle of 1863 Delamater was employing nearly a thousand men.[168] Like Novelty, Delamater made money during the war.

The Civil War, in fact, benefited all the *Monitor* companies, as it did other firms in the country. It enabled them to recover from a period of instability that beset the nation's economy in the years before the war. The conflict provided them with opportunities to prosper. The wartime reports of R. G. Dun & Co. clearly indicate that they did. The end of the war did not see an end to this prosperity, at least not immediately. But there were changes. Demobilization, an increasingly parsimonious Congress, and what one authority has referred to as "the naval establishment's resistance to technological change," resulted in a drastic decline in warship construction.[169]

There was an equal decline in merchant ship construction. This deterioration actually began before the war as American shipbuilders were unable to compete with the heavily subsidized British companies. The Civil War decimated the American carrying trade. Finally, in the postwar years, British competition once again hurt the American shipbuilding industry, particularly in the construction of iron ships.[170] To make matters worse, the government sold off hundreds of old blockaders, transports, and captured vessels.

Two years after the war, ship construction in New York City was virtually at a standstill. Novelty was completing *Wampanoag* and several other vessels, but there was only one merchant vessel on the stocks of the thirteen shipyards in New York City, Brooklyn, and Jersey City. When this ship was completed in the summer of 1868, it marked the end of New York's quarter of a century of leadership in the building of oceangoing steamships.[171] Shipbuilding in the area would be limited to river, harbor, and coastwise vessels. U.S. Census Agent Henry Hall in his report on the shipbuilding

164. Sloan, *Isherwood*, passim; Bennett, *Steam Navy of the United States*, pp. 399, 555, 576-77.

165. Bennett, *Steam Navy of the United States*, appendix; *The Scientific American*, new series, VIII (13 June 1863): 378. For copies of Novelty's contracts with the Navy Department see Entry 231, RG217.

166. *The Scientific American*, new series (24 February 1864): 131-32; III (31 January 1863): 74; VII (1 September 1862): 201. See also *The Scientific American*, new series, XI (20 August 1864): 106; X (11 June 1864): 378; *Journal of the Franklin Institute*, January 1863, pp. 40, 44.

167. New York, 368:931, Dun Col.; *The Scientific American*, new series, VII (4 April 1863): 229; X (6 April 1864): 243.

168. Baughman, *The Mallorys of Mystic*, p. 115; *The Scientific American*, new series, VII (2 August 1862): 74; (22 November 1862): 326; *Journal of the Franklin Institute*, pp. 175-78, 341-42, 344-47, 378-80.

169. Lance C. Buhl, "Mariners and Machines: Resistance to Technical Change in the American Navy, 1865-1869," *The Journal of American History* LXI (December 1974): 703-27; Walter R. Herrick, Jr., *The American Naval Revolution* (Baton Rouge, 1966), pp. 13-38.

170. James M. Morris, *Our Maritime Heritage* (1979), p. 198.

171. Nevitt, *American Steamships*, pp. 340, 348-49. See also Swann, *John Roach*, p. 23; and Syrett, *The City of Brooklyn*, p. 23.

industry published in 1882 said, "Since the war it has not been practicable to carry on iron-shipbuilding in New York City. . . . The building of hulls . . . has ceased, prices, wages and taxes being too high for that class of work."[172]

The *Monitor* companies were affected by the shipbuilding industry collapse. Novelty completed work on the machinery for the Pacific Mail steamers *Arizona* and *Great Republic* in 1866 and the *Wampanoag* in 1867. Although a loan of five hundred thousand dollars was made to the ironworks by the Pacific Mail Steamship Company to keep the company operating, it closed down in 1870. According to R. G. Dun, "the concern belonging to James Brown of Brown Brothers & Co., who are about closing it all up, trying now to dispose of it. The Business has not been lucrative for some time past and are under very heavy expenses."[173] The valuable property along the waterfront was sold to a gas company.

Horatio Allen, the company president for so many years, retired in 1871. Nevertheless, he came out of retirement for one more prominent engineering project, the construction of the Brooklyn Bridge. Although he knew little about building a suspension bridge, he served for three years as senior consulting engineer. Allen apparently did very little, the bulk of the work in designing and building falling on the shoulders of John A. Roebling. He retired a second time and, as a prominent New Yorker, was involved in civil activities for many years.[174] Allen died in 1889, eighty-seven years old at the time.

Cornelius H. Delamater would die that same year. Unlike Novelty, however, Delamater's ironworks were still in existence when he died. Also, unlike Allen's firm, Delamater's was able to continue a profitable business in the construction and repair of machinery for many years after the war.

This was at least partly because of the unusually strong business relationships between Delamater and two old associates, Ericsson and Mallory. In 1869 the ironworks received a contract to build and install the machinery for thirty small gunboats for the Spanish government to be used in Cuban waters. Half of the hulls were built by Mallory in Mystic, Connecticut, the remainder elsewhere. These gunboats had been designed by Ericsson.[175]

Delamater built the machinery for several steamships including *City of Merida* and *Fern*. Because of Ericsson's influence with Delamater, the company periodically sought government contracts, but with little success. Ericsson designed a torpedo boat which he named *Destroyer*, built at Delamater and financed partially by the firm. Although a number of apparently successful trials were carried out, the navy never showed much interest.[176]

While *Destroyer* was being built and tested, a submarine was constructed in another part of the plant. Designed by John P. Holland, she was built in some secrecy for Irish revolutionaries. The "Fenian Ram," as the submarine was called, never made it to Ireland, but was towed to Connecticut and evidently later sold for scrap.[177]

Delamater's nonmarine business was prosperous throughout the years. Large numbers of Ericsson's caloric engine, as well as a hot air pumping engine designed by one of the firm's engineers, were sold. In the seventies the company did considerable ironwork for the elevated railroad under construction in New York City. In 1871 a steam-powered drill for use in mines was produced, and later air compressors were manufactured. In the early 1880s the company began to build and sell

172. Henry Hall, *Report on the Shipbuilding Industry of the United States* (Washington, D.C., 1882), p. 202.

173. Nevitt, *American Steamships*, p. 341; Elting M. Morison, *Men, Machines and Modern Times* (Cambridge, 1966), pp. 98-99. New York, 368:931, Dun Col., Pursell, "Stationary Steam Engines," p. 183; Kouwenhoven, *Partners in Banking*, pp. 133-34.

174. For Allen's involvement see David McCullough, *The Great Bridge* (New York, 1972), pp. 22-23, passim. For Allen's social and civil life during his last years see "A Memorial of Horatio Allen," pp. 1179-81; George T. Strong, *Diary*, Allen Nevins and M. H. Thomas, eds. (4 vols., New York, 1952), III, passim; and Henry W. Bellows, *Historical Sketch of the Union League Club of New York* (New York, 1879), passim. Allen continued to correspond with Ericsson. See, for example, Allen to Ericsson, 19 January 1872, and Ericsson to Allen, 13 October 1873, in Ericsson Papers, American Swedish History Museum.

175. Porter, *The Delamater Iron Works*, pp. 15-17; Church, *Ericsson*, II:127-30; Carol W. Kimball, "The Spanish Gunboats," *The Log of Mystic Seaport* XXII (Summer 1970): 51-58; Baughman, *The Mallorys of Mystic*, pp. 129-31; Lawrence A. Clayton, "The Incident of the Spanish Gunboats," unpublished manuscript, Mystic Seaport Library (Mystic Seaport, Conn.). Ericsson designed the gunboats. See Ericsson to Delamater, 30 December 1869, Ericsson Papers, American Swedish History Museum.

176. For example, see Ericsson to Fox, 24 November 1865, 23 February 1867, Ericsson Papers, American Swedish History Museum. Church, *Ericsson* II:166-70, 158-passim; Ericsson to Delamater, 23 November 1880, Ericsson Papers, American Swedish History Museum.

177. Richard K. Morris, *John P. Holland, 1841-1914, Inventor of the Modern Submarine* (Annapolis, 1966), pp. 35-43, 186-88; Simon Lake, *The Submarine in War and Peace* (Philadelphia, 1918), pp. 96-111.

refrigerated ice machinery. Despite this apparent success, when Cornelius Delamater died in 1889, his son sold the business the following year.[178]

Continental Iron Works, which had acquired a reputation as a builder of iron steamers and armored vessels, rebuilt one monitor, *Monadnock*, after the war. The company also constructed two iron ferries, *Fulton* and *Farragut*, for the Union Ferry Company; the steamer *Nanking* for the China trade; several steamboats for Cuban waters; and fifty surfboats for the U.S. Life Saving Service. Continental's marine work virtually ended by the mid-seventies. Nevertheless, a story in the *Nautical Gazette* mentioned that "these works [were] . . . capable, in every respect, for the construction of iron and composite vessels of every description, revolving turrets, armor plate, [and] gun carriages."[179]

Thomas Rowland, the firm's owner, also began to design and manufacture steam engines and boilers especially adapted for use in the oil industry and gas works. Continental constructed the gas works for Brooklyn in 1867, followed by similar plants throughout the country. He experimented in iron and steel welding and in the late eighties, designed the process and equipment used by his company in the manufacture of corrugated furnaces and "Morison suspension furnaces," widely used for many years in the internal furnace type of boiler.[180] Rowland would die in 1907, but the company would continue in business for several years specializing in the manufacture of welded steel works.

Holdane and Company remained in business for ten years after the end of the Civil War. R. G. Dun reported in November 1866 that the firm was "doing a good and cautious business." In 1873 Dun mentioned that Holdane had a good reputation in iron manufacturing, and "has made money." Two years later Dun noted that the company was "an old established concern doing a legitimate steady business." Nevertheless, on 10 July 1875 the company was dissolved "by mutual consent." No reason is given for the decision, although a Dun report does mention that James Holdane's wife had inherited considerable money.[181]

The *Monitor* companies located outside New York City also survived in the postwar years. Clute Brothers specialized in Ericsson's caloric engines and machine repair for vessels plying the Erie Canal. In 1876 the company received a contract to manufacture "Lay" torpedoes. That same year Cadwallader C. Clute, who had managed the works since 1842, died. In 1879 Clute Brothers closed down.[182]

The Niagara Forge Works in Buffalo advertised in 1866 that they manufactured "all kinds of light and heavy forgings and hammered shapes for rail roads, steamboats and propellers, such as car axles, crank axles, truck and driving axles, wrought iron driving wheels, locomotive frames, steamboat and propeller shafts and cranks, connecting rods, piston rods, crank pins, mill shafts, anchors, hammered bar iron and shafting of any length and size."[183] Patchin joined Charles Delaney as a partner in the works. Four years later, however, he sold out to Delaney. Shortly after this the company was reorganized as the Delaney Forge & Iron Company. Charles Delaney died in 1883, but his son continued the business until 1902 when he died. The firm was then reorganized as a corporation and continued in business until the mid-1920s.[184]

Rensselaer Iron Works and the Albany Iron Works in Troy emerged in the postwar years as leading firms in the nation's new steel industry. In 1863 Alexander L. Holley, an engineer and one of the editors of the *American Railway Review*, went to England evidently with instructions from Winslow, Corning, and Griswold, to obtain the American rights to the Bessemer steel process.[185] A recent biography of Holley suggests that he consulted Ericsson after his return from England and the Swedish engineer recommended him to the Troy

178. Porter, *The Delamater Iron Works*, pp. 13-20; Church, *Ericsson* II:274-75; "Cornelius Delamater," in *D.A.B.*; Ericsson to R. Candon, 29 October 1880, Ericsson Papers, American Swedish History Museum; advertisement for a hot air pumping engine by Delamater, dated February 1880, copy in Eleutherian Mills Historical Library, Wilmington, Del. The copy includes illustrations.

179. Supplement, 13 January 1875. See also Bishop, *American Manufactures* III:133; "Thomas Rowland," *D.A.B.* A 1908 advertisement included a drawing of the works showing vessels under construction and others alongside docks.

180. "Thomas Rowland," *D.A.B.* See also advertisement for Morison suspension furnace including illustration dated 1908 in Eleutherian Mills Library, Wilmington, Del.

181. Various comments of R. G. Dun & Co., in New York, 323:G900, G890a, G890b, Dun Col. No reason is given for dissolving the business. Dun does mention in an earlier report that James Holdane's wife inherited considerable money.

182. Monroe, *Schenectady, Ancient and Modern*, pp. 241-48; Westover, *Schenectady Past and Present*, pp. 49-50.

183. *The Manufacturing Interests of the City of Buffalo* (Buffalo, 1866), p. 126; 120 hands were employed at that time. See also Smith, *History of Buffalo* II:240.

184. Henry W. Hill, *Municipality of Buffalo, New York, A History* (2 vols., New York, 1923), II:802.

185. Neu, *Corning*, pp. 55-56; "John Flack Winslow," *D.A.B.*; Morison, *Men, Machines and Modern Times*, p. 140.

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entrepreneurs. However, this does not seem logical as Holley visited a Bessemer plant in 1862, and returned to the United States and back to England in 1863.[186] Holley, in partnership with three Troy businessmen, erected the first Bessemer plant in North America on the grounds of the Rensselaer Iron Works. The Bessemer Steel Company, as the new firm was named, began producing steel in February 1865. Despite complications concerning patent rights, the depression of the 1870s, which resulted in the works temporarily closing down, and a series of labor strikes, the Bessemer facility and the two parent ironworks continued to expand throughout the two decades following the end of the war.[187]

During these years the Troy iron and steel works produced steel rails, structural steel, axles, nails, plate, angle and bridge iron, and "merchant iron." In 1866 they even cast an experimental steel cannon. There is no evidence that they sought government contracts, although their interest in ordnance suggests that they probably did so. Their business relationship with Ericsson endured only briefly. Griswold acted as his agent in Washington and both he and Winslow persevered in backing the Swedish inventor financially.[188] This changed in 1867. Winslow retired, selling out his interest in the works to Griswold. In 1866 Griswold, who was still in the House of Representatives, changed committee assignments, going from the Naval Affairs Committee to the Ways and Means Committee. In 1868 he was an unsuccessful candidate on the Republican ticket for the governorship of New York.[189]

In 1875 Corning and Griswold consolidated the iron and steel works into the Albany and Rensselaer Iron & Steel Company. In 1885 the firm was incorporated as the Troy Steel and Iron Company. In 1903 the United States Steel Corporation acquired the Troy works. Griswold died in 1872 and Corning shortly afterwards. The iron and steel works under management prospered until the early nineties. The depression of 1893 apparently triggered a decline and long before U.S. Steel obtained the works, they were idle and in receivership.[190]

Like the Troy companies, Abbott & Son of Baltimore continued expanding in the post-Civil War years. Shortly after the war ended, the ironworks incorporated as the Abbott Iron Company with Horace Abbott, the firm's longtime owner, as president. By 1882 the establishment covered approximately eleven acres and consisted of three plate mills (a fourth was built a few years later), two puddling mills, and one rail mill. In these years the company concentrated in the manufacture of railroad rails, and boiler and plate iron. Employees varied from five hundred to a thousand. Horace Abbott died in 1887, but the company continued into the twentieth century. Abbott & Son, which fabricated more armor plate for warships than any other firm in the Civil War, apparently made no effort to seek government work when the new steel warships were laid down in the mid-eighties. Instead, the plant specialized in railroad and domestic iron and steel until it closed down.[191]

The Civil War was fought at a time when the United States was beginning to accelerate toward industrial importance. The nation was already one of the world's industrial leaders in 1860 with manufacturing employing almost one-seventh of the labor force. Before the war American contributions in industrial and transportation technology were gaining recognition. The American exhibits at the Crystal Palace Exposition in London in the mid-1850s impressed Europeans. Other inventions, particularly in domestic industries, illustrated American ingenuity. Cyrus McCormick's reaper

186. See McHugh, *Holley*, pp. 171-72.

187. Weise, *Troy's One Hundred Years*, pp. 265-66; James M. Swank, *History of the Manufacture of Iron in All Ages* (Philadelphia, 1892), pp. 409-10; A. L. Holley and Lenox Smith, "American Iron and Steel Works," *Engineering* XL (24 December 1880): 590-616; Wolfgang P. Strassmann, *Risk and Technological Innovation: American Manufacturing Methods During the Nineteenth Century* (New York, 1959), pp. 34-35; *Memorial of Alexander Lyman Holley, C. E., LL.D.* (New York, 1884), passim.

188. Ericsson to Griswold, 9 December 1865, 2 February, 6 June, 13 September, 17 October, 1866, Ericsson Papers, American Swedish History Museum; Sloan, *Isherwood*, pp. 47-48; Church, *Ericsson* II:187-88; Joel Munsell, *The Annals of Albany* (2d ed., Albany, 1869), pp. 52, 54, 56.

189. "John Flack Winslow," *D.A.B.*; Redlich, *History of American Business Leaders* I:96-107; Rezneck, *Profiles Out of the Past*, pp. 99, 102-3; Wheeler, *Winslow*, pp. 8-9. For Griswold's political career see Donald B. Chidsey, *The Gentleman from New York: A Life of Roscoe Conkling* (New Haven, 1935), pp. 135-37, 167; James G. Blaine, *Twenty Years of Congress* (2 vols., Norwich, Conn., 1884), I:497, II:252-55, 526-27; Welles, *Diary* I:531, II:31; Robert P. Sharkey, *Money, Class, and Party: An Economic Study of Civil War and Reconstruction* (Baltimore, 1959), pp. 73-passim; David M. Jordan, *Roscoe Conkling of New York: Voice in the Senate* (Ithaca, N.Y., 1971), 110-14; Michael Lee Benedict, *A Compromise of Principle: Congressional Republicans and Reconstruction, 1863-1869* (New York, 1974), pp. 226-passim; Strong, *Diary* IV:231, 244.

190. Weise, *Troy's One Hundred Years*, p. 266; Hogan, *Economic History of the Iron and Steel Industry in the United States*, vol. II, pt. III, p. 487; Neu, *Corning*, p. 59-61.

191. *Industries of Maryland: A Descriptive Review of the Manufacturing and Mercantile Industries of the City of Baltimore* (New York, 1889), p. 179; Baltimore *Sun Magazine*, 7 July 1953; Scharf, *History of Baltimore*, p. 427.

and especially the sewing machines of Elias Howe and Isaac Singer were sold abroad. By the war's outbreak Singer's European outlets were selling more sewing machines than some three thousand salesmen were able to sell in the United States.[192]

The Civil War clearly stimulated developments in technology. "It was the first struggle in which science and machinery played a dominant part, and it was the first time that technological innovations and improvements were applied on a large scale in a major war." Bernard and Fawn Brodie agreed: "The American Civil War was a colossal proving ground for improved weapons of all kinds. For the first time the achievements of the industrial and scientific revolution were used on a large scale in war." Ericsson himself wrote that "the time has come, Mr. President [Lincoln] when our cause will have to be sustained not by numbers, but by superior weapons. By a proper application of mechanical devices alone will you be able with absolute certainty to destroy the enemies of the Union."[193] The most famous of these "mechanical devices" was one designed by Ericsson, *Monitor*.

The *Monitor* has been characterized as symbolic of the industrial and transportation revolutions that transformed the United States in the nineteenth century. The companies that built the warship were not only representative of these revolutions, but were significantly involved in the technological developments that made them possible. Some were at the forefront. The history of these companies graphically illustrates the emergence of the United States as an industrial nation.

192. William N. Still, Jr., "The Historical Importance of the *USS Monitor*," unpublished MSS in possession of the author.

193. Quoted in Still, "The Historical Importance of the *USS Monitor*."

Dr. William N. Still, Jr., Professor of History and Co-Director of the Program in Maritime History and Underwater Research at East Carolina University, Greenville, N.C., received his Ph.D. from the University of Alabama in 1964. He is the author of a number of books, including Iron Afloat: The Story of the Confederate Armorclads *(1970 and 1985);* American Sea Power in the Old World. The United States Navy in European and Near Eastern Waters, 1865-1917 *(1980); and* Confederate Shipbuilding *(1969). Dr. Still, who co-authored* Why the South Lost the Civil War *(1986), has written for historical magazines, professional journals and other publications. He is editor of a maritime history series, currently being published by the University of South Carolina Press, and a member of the United States Commission on Maritime History. From 1983 to 1985, Dr. Still was chairman of the Governor's Advisory Committee on Archaelogy for the state of North Carolina.*

Book Reviews

BRITON COOPER BUSCH, *The war against the seals: a history of the North American seal fishery* (Kingston and Montreal: McGill-Queen's University Press, 1985). 9″ x 6″, cloth, xviii + 374 pages, 49 illustrations, 5 graphs, 11 maps, 9 tables, bibliography, index. $29.95 (Canadian).

In his preface, Mr. Busch says that in the course of doing research on a nineteenth-century American sealer he became aware that there was no general history of sealing from North American ports. This lack inspired him to undertake to fill this gap in the literature of maritime history, and the present volume is the result. To this reviewer it seems that the author has attained his objective admirably.

Briton Cooper Busch is professor of history and chairman of the Department of History at Colgate University. He already has to his credit six volumes that he has written or edited in the fields of diplomatic and maritime history. Several of these have impinged on aspects of the subject of this general book, and thus he brings to this study not only wide reading and research in the broad field of the volume but also insights gained through intimate knowledge of aspects of the subject.

The book opens with a prologue in which the far-ranging sealing and sea-otter hunting voyages from New England ports between 1783 and 1812 are described. These took Yankee ships and seamen to distant parts of the globe, and resulted in the near-extinction of the fur-bearing mammals that were the object of the hunters.

The heart of the book consists of two parts. One deals with sealing voyages from Newfoundland between 1790 and 1916. At first they went out of a number of outports along the coast of the island, but increasingly they were centered at St. John's. Seals were principally taken on the ice pack as it floated south into the Atlantic. The second part is centered on sealing in Pacific waters, particularly the Pribilof Islands and the Alaskan coast between 1867 (when Russian rule in Alaska ended) and 1911. There is a chapter on the taking of elephant seals in the South Atlantic and Indian Ocean as well as along the coasts of Mexico and California, and another on fur sealing in distant waters. Finally there is an epilogue which carries sealing in the Pribilofs from 1912 to 1980 and from Newfoundland from 1914 to 1984.

The book is evidently based on wide-ranging research, and its bibliography runs to forty-two pages in length. In his treatment of a subject that has often aroused strong emotions, Mr. Busch is admirably even-handed. He takes neither the side of the sealers nor of the conservationists unreservedly. Various aspects of the subject are considered and described fully. The book is remarkably well written, and the author's good style carries the reader along pleasantly albeit providing much solid material and food for consideration.

The photographic illustrations are numerous and well selected while the graphs and tables of figures illustrate trends and summarize developments admirably. Some of the eleven maps located at the end of the text are reproduced on such a small scale as to require a magnifying glass to be used effectively.

In every way this is an excellent book, and one that deserves a place in any library, public or private, that pretends to be comprehensive in its coverage of maritime history.

JOHN HASKELL KEMBLE

Pomona College

RONALD CHALMERS HOOD III, *Royal Republicans, the French Naval Dynasties Between the World Wars* (Baton Rouge, La.: Louisiana State University Press). 211 pages, illustrated. $25.00.

France and the French are eternally fascinating; there is a curious predictable surprising quality which never ceases to astonish but yet ought not to do so. As European society became increasingly egalitarian in

the post-World War I era the French managed to keep some parts of society almost as if the French Revolution, let alone a great international conflict that decimated her population, had never taken place. This state of affairs may well have existed elsewhere on the continent but in France it was somehow rather more unexpected. Who were these people who acted virtually in a time warp? They were French naval officers and their families and this book about them is fascinating.

The author analyzes France's naval personnel—the officer class—from 1914 to 1939 with a sort of coda to cover the period after World War II. These individuals and their families were a closed social unit; they were intimately connected through marriage and career interests. They tended to reside in enclaves and their houses were memorials to the naval profession. The machinations to get a son into the *École navale* would make the plot for a good novel by a French Galsworthy and the social snobbery of the *Grand corps* with respect to the *petit corps*—almost naval tradesmen—would put Lady De Brugh to shame. If the author had not cited his references with such care one would almost be inclined to imagine that he was composing a work of fiction.

Elites or would-be elites are never boring as subjects of interest to the historian or the sociologist and certainly the French naval officers of this period serve to prove this nicely. They were benighted and bigotted, pedantic and pious, limited and ludicrous but they were always prepared to do their duty even when the government they served seemed totally opprobrious to them.

French naval personnel were intellectually better prepared than their contemporaries in Great Britain. However, their professional education generally was inferior. To be sure men like Adm. Hector Villette with a superb knowledge of optics and gunnery or Adm. Henri Salaün as a first-class strategical planner did exist but they were distinctly in the minority. Most were rather pettigogging characters who were chiefly concerned with preserving the system. An officer interested in reform was regarded as "not one of us" and his career was likely to be somewhat limited. The interwar French governments seem to have accepted the state of affairs with relative equanimity; even the *Front Populaire* hardly made any real change and Léon Blum actually appointed Adm. François Darlan as his chief of staff. The latter was ultimately to personify all that found Blum & Co. opprobrious: at one moment he was the confidant of Marshal Pétain, in the next he was the *intrigueur par excellence* carving out a place for himself in a changed France when the Vichy government collapsed. Darlan in a way is the embodiment of much that was egregious about French naval society—a man distrustful of the world in which he lived yet incapable of having the perceptivity to recognize that he inhabited a dream world.

The author is to be congratulated on producing such an unusual book, one not only suitably academic but highly readable. One would wish that other scholars had his wit and his élan and his skill with the pen—if this were so there would be far fewer carping comments about the academy writing just for itself.

S. W. Jackman

University of Victoria
Victoria, B.C.

E. Mowbray Tate, *Transpacific Steam* (New York, London, Toronto: Cornwall Books, 1986). 8½" x 11", cloth, 272 pages, illustrations, glossary, bibliography, index of principal ships. $39.95.

This most interesting and comprehensive book treats the subject of steam navigation across the Pacific Ocean from its beginning to 1941, when the spread of the Second World War into that part of the world completely and permanently changed the character of the subject.

The text is divided into twelve parts, of which the first five, comprising about three-fifths of the book, are devoted to the steamship services themselves—the most important topic, while the remaining seven shorter chapters deal with various special aspects of that topic.

The first chapter begins with a brief treatment of the history and geography of San Francisco Bay, followed by a similar treatment of the early crossings of the Pacific by steam vessels and a more detailed treatment of the service of the Pacific Mail Steamship Company, which had been operating coastwise services since 1848, but which did not engage in transpacific trade until the sailing of *Colorado* from San Francisco for Yokohama and Hong Kong on 1 January 1867. She was followed by other wooden paddle steamers, of which the best known were *Great Republic, China, Japan,* and *America,* all completed between 1867 and 1869 and all obsolete even when new, and were succeeded by iron propellers, of

which the largest were *City of Pekin* and *City of Tokio* of 1874. The latter was wrecked in 1885 and replaced by the British-built *China* (1889). In 1901 the Newport News Shipbuilding & Drydock Company completed *Korea* and *Siberia* for the Pacific Mail. With a gross tonnage of 11,300 and a speed of 18 knots, they upgraded the company's service, which was further reinforced by the charter and subsequent purchase of *Manchuria* and *Mongolia,* still larger, though not as fast, which had been built in 1904 for the Atlantic Transport Line by the New York Shipbuilding Co., Camden, New Jersey. Their addition marked the high-water mark of Pacific Mail's express fleet. Increasing competition and passage of the La Follette Act in 1915 led to the withdrawal of Pacific Mail service in August of that year and the sale of their five principal steamers to the Atlantic Transport Company. Control of Pacific Mail was acquired jointly in 1915 by American International Corp. and W. R. Grace & Co., and the high profits earned by ships at the time induced them to return to transpacific shipping with the purchase in 1916 of the steamers *Ecuador, Venezuela,* and *Colombia,* 5,700 tons gross and built the previous year for the Royal Dutch West India Mail S.S. Co. They remained in transpacific passenger service until 1921, at which time they were transferred to coastwise service upon Pacific Mail's assuming operation of five "535"-class ships for the Shipping Board. Failure to purchase these steamers in 1925 effectively meant the end of Pacific Mail. During its career the company also operated intermediate passenger ships and freighters in transpacific service, of which some details are given.

While Pacific Mail met its first competition on the transpacific run from San Francisco in 1873, competition was not serious until the formation late in 1874 of the Occidental & Oriental Steamship Company by officials of the Central Pacific and Union Pacific Railroads, using steamers chartered from the British White Star Line (Oceanic Steam Navigation Company), including *Oceanic* (1871), *Belgic* (1873), *Gaelic* (1873), *Arabic* (1881), *Coptic* (1881), *Belgic*(II) (1885), *Gaelic*(II) (1885), and *Doric* (1883). O. & O. soon came to a working agreement with Pacific Mail and from 1893 the two companies were virtually identical, and in 1908 O. & O. disappeared, *Doric* and *Coptic* becoming *Asia* and *Persia* respectively of the Pacific Mail intermediate service.

The third chapter of the book treats steam service between San Francisco and Australia and New Zealand, at first by small lines with short lives, then (1875-1885) by Pacific Mail. From 1885 the service was carried on by Spreckels' Oceanic S.S. Co., of which control was acquired by the Matson Line (previously in the San Francisco-Hawaii trade) about 1926. Among the better known Oceanic-Matson ships were *Alameda, Mariposa, Sierra, Sonoma, Ventury, Malolo, Mariposa*(II), *Monterey,* and *Lurline*(II).

Union Steamship Company of New Zealand, which by agreement shared the San Francisco-New Zealand-Australia line with Oceanic from 1885 to 1900, returned to the route independently in 1910, continuing until 1936. Typical ships were *Maitai, Tahiti,* and *Maunganui.*

Chapter 4 deals with Japan's entry into the transpacific trade from San Francisco, when Toyo Kisen Kaisha placed the new passenger steamers *Nippon Maru, America Maru,* and *Hong Kong Maru,* each about 6,000 tons gross, on the line in 1899, using the facilities of Pacific Mail at San Francisco. *Tenyo Maru* and *Chiyo-Maru* were built in 1908 and *Shinyo Maru* in 1911, all over 13,000 tons gross and with a speed of more than 18 knots. *Chiyo Maru* was lost by stranding in 1916, but shortly afterward *Korea Maru* (ex-*Korea*) and *Siberia Maru* (ex-*Siberia*) were acquired from Atlantic Transport and *Taiyo Maru* (ex-*Cap Finisterre*) added after the war. In 1905 T.K.K. established a South American passenger service with smaller and slower ships. In 1926 T.K.K. transferred all its passenger ships to Nippon Yusen Kaisha, which gradually replaced them with modern motorships, although T.K.K. continued to operate purely cargo vessels.

The Pacific Mail S.S. Co. withdrew its transpacific service in 1915. Two of its older ships, *China* and the former RMSP *Nile,* were acquired by Chinese American interests operating as the China Mail S.S. Co., and three years later they added *Nanking,* rebuilt from the burned-out *Congress* of Pacific S.S. Co. However, due to a variety of difficulties, China Mail ceased operations in 1923, *Nanking,* its only modern ship, becoming *Emma Alexander* of the Admiral Line.

"Captain" (an unofficial honorary title) Robert Dollar was essentially a timberman who from 1892 operated a variety of freighters, large and small, primarily to carry his lumber cargos, with such return cargos as he could get. Some of these voyages went around the world and in 1923 he entered the around-the-world pas-

senger trade with the purchase from the United States Shipping Board of seven "525"-type steamers of about 10,500 tons gross each, of which the first to leave San Francisco was *President Harrison* (ex-*Wolverine State*) (1920), which received a tremendous send-off. They were joined in 1929-1930 by *President Johnson* and *President Fillmore*, the former *Manchuria* and *Mongolia* of Pacific Mail, and in 1931 by the new and larger *President Coolidge* and *President Hoover*. In the meantime the Dollar interests had acquired in 1925 the five "535" steamers then being operated by Pacific Mail, but in the Depression the Dollar Line was unable to meet the payments on these ships and was succeeded by the American President Line. New ships were ordered and usually received names of earlier ships, whose name changes are summarized in a table.

Chapter 7 deals with the major cargo lines crossing the Pacific from San Francisco. Service by steamers carrying primarily or only cargo went back to the early 1870s, but did not assume substantial proportions until the use of chartered steamers during the Spanish-American War and the Boxer Rebellion. Shortly after the turn of the century, the Robert Dollar Company started sending purely cargo vessels, some under the British flag, across the Pacific, a service that later developed into their around-the-world service for both passengers and cargo. Other cargo services were operated by the Java-China-Japan Line (Dutch) (from about 1903) and the Kerr S.S. Co. (from 1916) in conjunction with various Japanese lines and the British Silver Line of Stanley & John Thompson. Most of the major Japanese companies had a share in this business, and an important American transpacific cargo line was the Oceanic & Oriental (not Orient) Steamship Company, organized jointly in 1928 by the Matson Navigation Company and the American-Hawaiian Steamship Company, which lasted for ten years. They called at all important Pacific Coast ports, including those in British Columbia.

Part 2 treats the shipping of southern California. Los Angeles had no natural harbor, but a beginning of constructing a harbor was made in 1888 and continued through the years until it is now the largest artificial harbor in the world, due largely to petroleum exports since 1915. The development of Long Beach was later and less extensive. San Diego has a good natural harbor, used mainly by the U.S. Navy. Passenger sailings from Los Angeles were primarily by cruise ships, but Toyo Kisen Kaisha and Osaka Shosen Kaisha lines from Japan to South America called there regularly, and it became the terminal port for many of Dollar Line passenger ships, partly because fuel oil was cheaper there. Various companies are mentioned, especially Japanese, operating freighters that called at Los Angeles on voyages to Central and South America and to the East Coast of North America.

Part 3 is devoted to navigation on the Columbia River. Sandbars formed an obstacle which took many years to overcome, but as of today the river offers a safe, modern harbor for ships drawing up to forty feet. Transpacific services from Portland essentially began in the 1880s and were conducted with chartered steamers, a large number of which are mentioned by name. Among the prominent firms involved was the Portland & Asiatic Steamship Company, whose charters included *Nicomedia* (not *Nicodemia*) (1901) of Hapag. One of the earliest overseas lines from Portland was that of Frank Upton, who chartered various steamers, including the German *Pemptos* (not *Pempton*) (1885). Portland & Asiatic withdrew in 1911 and transferred its charter obligations to Frank Waterhouse & Company. The States Steamship Company, formed in 1928, acquired a number of ships from U.S.S.B. and in 1932 purchased three passenger ships from United Fruit Company, which were renamed *General Pershing*, *General Lee*, and *General Sherman*, but the service was withdrawn in 1937 when it proved uneconomical to rebuild the ships to conform to the Maritime Act of 1936, although the cargo business of States Steamship Company continued. Seattle and Tacoma, the principal ports of Puget Sound, developed later, due to slowness of the railroads in reaching them. There were two Northern Pacific Steamship companies, of which only the second was owned by the railroad of that name. Frank Waterhouse was agent for steamers of Boston Steamship Company, a subsidiary of Boston Tow Boat Company, whose two largest vessels, *Shawmut* (1902) and *Tremont* (1902), were converted to passenger carriers after about a year; he was also agent for vessels of the China Mutual S.N. Co., absorbed in 1902 by Alfred Holt's Blue Funnel Line. James J. Hill organized the Great Northern Steamship Company about 1900 and they built *Minnesota* and *Dakota* in 1904, the largest vessels of their day under the American flag, but the latter was wrecked off the Japanese coast on 5 March 1907 and was not replaced. Nippon Yusen Kaisha

inaugurated a Seattle-Japan service in 1896 with *Miike Maru,* followed by increasingly larger steamers, most or all of which are mentioned. The motorship *Hikawa Maru* (1938) had the distinction of being the only Japanese passenger vessel to survive World War II and return to its prewar route. O.S.K. had a similar, somewhat smaller service. Their first regular steamer was *Tacoma Maru* (1909), but the second, *Seattle Maru,* was not ready in time, so the British steamer *Fitzpatrick* was chartered from Burrell & Son to take her place. There were four further sister ships in the first group. Larger ships were added in 1915-1920, but the line was given up in 1937, not to be resumed until after World War II.

The Admiral Oriental Line, which could trace its roots back to Goodall, Nelson & Perkins (1860), began transpacific sailings in 1921 with "535"-type Shipping Board steamers, managed at first by Pacific Steamship Company and after about a year by the Dollar interests. In 1926 the latter purchased the ships and the name of the line was changed to American Mail Line, which prospered for a time, but gave up in 1938, due in part to labor troubles and in part to the Merchant Marine Act of 1936. It was reorganized in 1940 with new C-1 and C-2 ships, at which time the Dollar family was eliminated. Chapter 16 deals with various major cargo lines of Puget Sound.

Part 5 treats transpacific shipping from British Columbia, particularly with the Canadian Pacific passenger and cargo service form Vancouver. Starting with second-hand tonnage, they chartered other ships and built *Empresses of India, Japan,* and *China* (1891); *of Asia* and *Russia* (1913); *of Canada* (1921); and *of Japan*(II) (1930). Also in 1921 they bought the surrendered German *Tirpitz* and renamed her *Empress of Australia.* She is best known for the help she rendered at the time of the Japanese earthquake of 1923.

Chapter 18 deals with the All Red Route, started by James Huddart in 1893 and continued first by the New Zealand Shipping Company and later by the Union Steamship Company of New Zealand. Among their best-known ships were *Maheno* (1905), *Niagara* (1913), *Aorangi*(II) (1924), and *Awatea* (1936).

Chapter 19 describes briefly the major cargo lines of British Columbia and concludes part 5, dealing with transpacific ships and shipping companies as such. The remainder of the book is devoted to various special topics connected with transpacific steam navigation. Chapter 20 deals with around-the-world cruises for pleasure. While around-the-world travel by individuals or by parties goes back to the beginning of Pacific Mail's transpacific service in 1867, the first world cruise ship in the modern sense was the Hapag *Cleveland* in 1909. It made similar cruises in 1912 and 1913 and they were resumed after the war by *Laconia* of Cunard Line, followed by other transatlantic liners, often under charter to Thomas Cook & Son, American Express Company, or Raymond & Whitcomb. A succession of cruising vessels continued down to the Second World War, Canadian Pacific's *Empress of Britain* (1930) being the largest and most regular vessel in the service, continuing right up to 1939. Food was important and the author gives illustrative lists of ships' stores. Beginning in 1926-1927 there were also round-the-world cruises for study, but these were less numerous, less luxurious, and less successful.

Part 7 describes scientific expeditions that crossed the Pacific. Much of this is classed as hydrography and includes charting, sounding, and the observation of currents and of the tracks of storms. Ships prominently engaged included USS *Tuscarora,* USS *Ranger,* and the nonmagnetic yacht *Carnegie,* but numerous others are mentioned, cable-laying ships, notably *Colonia* (1902), designed to carry cable enough for the stretch between Vancouver Island and Fanning Island, the longest stretch of ocean cable in the world. No second Pacific cable was laid, as by 1925 the U.S. Navy had constructed powerful radio stations more reliable than cables.

Part 8 is devoted to military and naval crossings of the Pacific. Chapter 24 is a very interesting treatment of army transport service to the Philippines from about late 1898. Most of the important transports, which were acquired secondhand, are mentioned and illustrated. Two definite, but not very serious, errors appear in this chapter. On page 195 it is stated that *Mohawk* (later *Grant*), *Manitoba* (later *Logan*), *Massachusetts* (later *Sheridan*), and *Mobile* (later *Sherman*) had three masts. But actually they had four. The illustration of *Sherman* makes her appear to have three masts, but the stern of the ship, including the fourth mast, does not appear in the picture, although booms from it are visible and other photographs (not in the book) confirm this. Again, *Meade* (ex-*Berlin*, ex-*City of Berlin*) was built at Greenock, Scotland, and not in Germany as stated on page 198. A few transports in service after World War I are

mentioned, notably *Mount Vernon* (ex-*Kronprinzessin Cecelie*) (1906).

Chapter 25 deals with the U.S. Navy in the Pacific. Beginning in the 1890s, an increasing number of modern warships, most of which are mentioned by name, were built on the Pacific Coast and many of them crossed the ocean on their way to and from service on the Asiatic Squadron. Also described is the voyage around the world of the Great White Fleet under Admiral Evans in 1907-1909, insofar as it involved the crossing of the Pacific. Various other naval crossings down to the attack on Pearl Harbor are mentioned.

The remainder of the book is devoted to people rather than to ships. Chapter 26 discusses first-class passengers, especially prominent ones; chapter 27 deals with Chinese and Japanese immigrants and the problems they created upon their arrival; part 10 with the officers and crews of the steamers—including a discussion of the all-too-frequent labor problems. Part 11 discusses, with numerous illustrations, exports and imports involved in transpacific trade, and part 12, the final chapter, contains biographies of Rennie P. Schwerin (Pacific Mail), Leland Stanford (Occidental & Oriental), Masazumi Murioka (N.Y.K.), James J. Hill (Great Northern), and Robert Dollar.

It will be seen from the foregoing outline that the author has covered a broad but well-defined field and this has involved a very skilful condensation of a vast amount of material. It would be impossible to list in a book of this size all the steamers and motorships in transpacific service down to 1941, but a good selection is made. Particularly unusual is the treatment of chartered steamers, of which there were a surprisingly large number. Illustrations are numerous and excellent. Among the more unusual are *Arabic* (1881), chartered by O. & O. for about a year, and Wright, Graham & Co.'s *Falls of Orchy* (1907), chartered by the Royal Mail & Glen Line about 1913. The general plan is to treat the shipping lines in order of their beginning service, grouping them at the same time by nationality and by ports served. As most large lines, especially in the present century, served most or all of the principal West Coast ports, material on any particular line may appear at several places in the text. Technical details are usually restricted to length, gross tonnage, and builders given mainly for the more important ships, but information given is well chosen and smoothly presented, and the book can be highly recommended to anyone interested in transpacific steam navigation.

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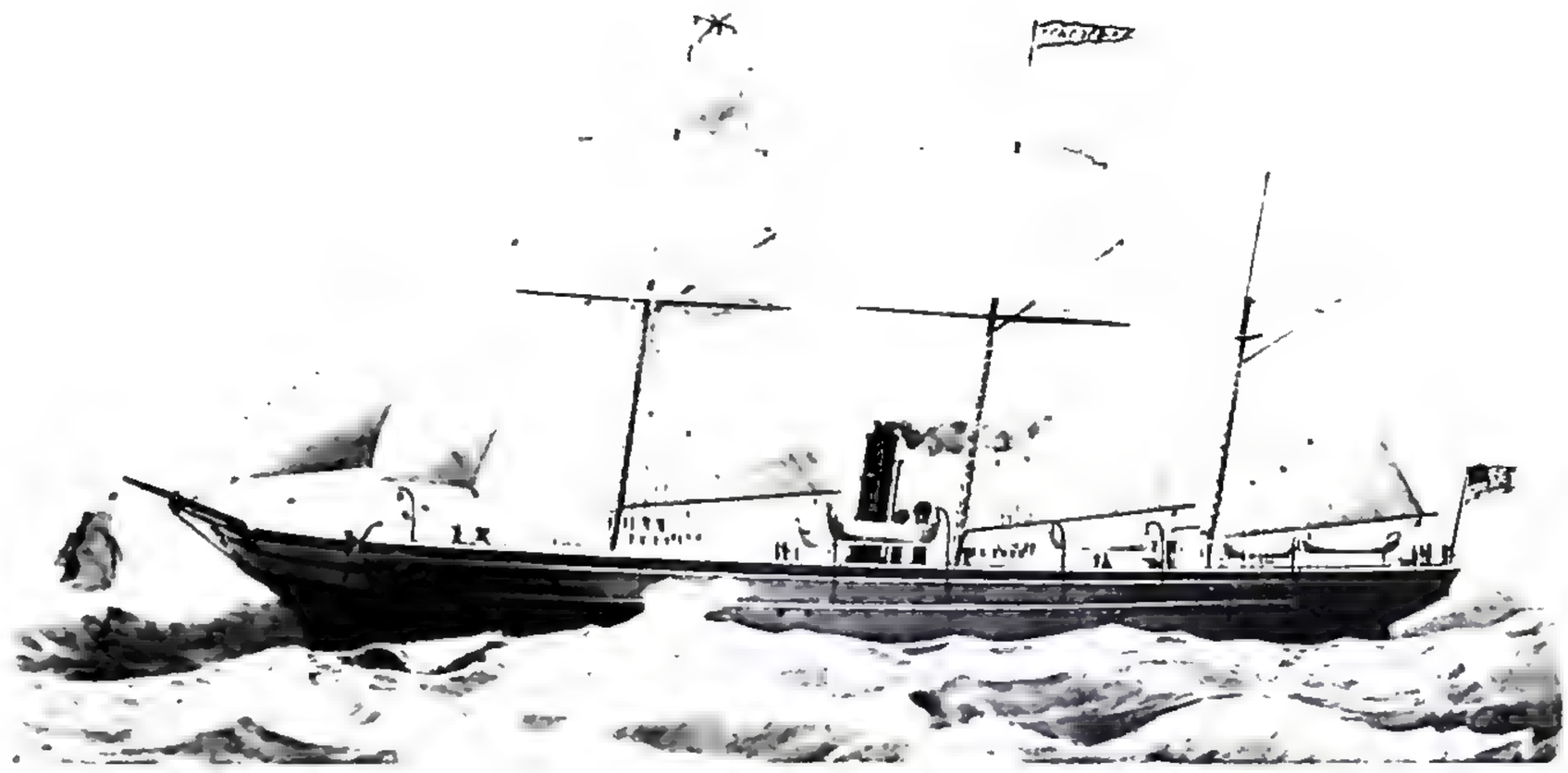

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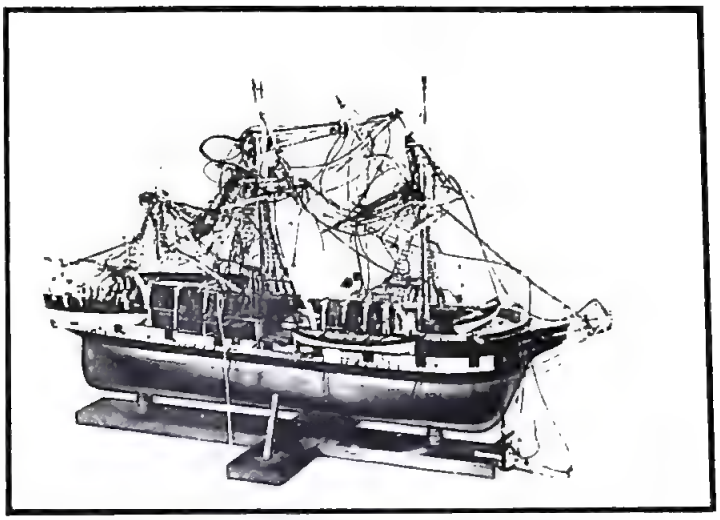

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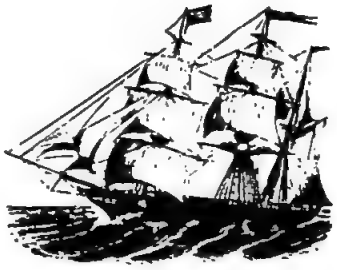

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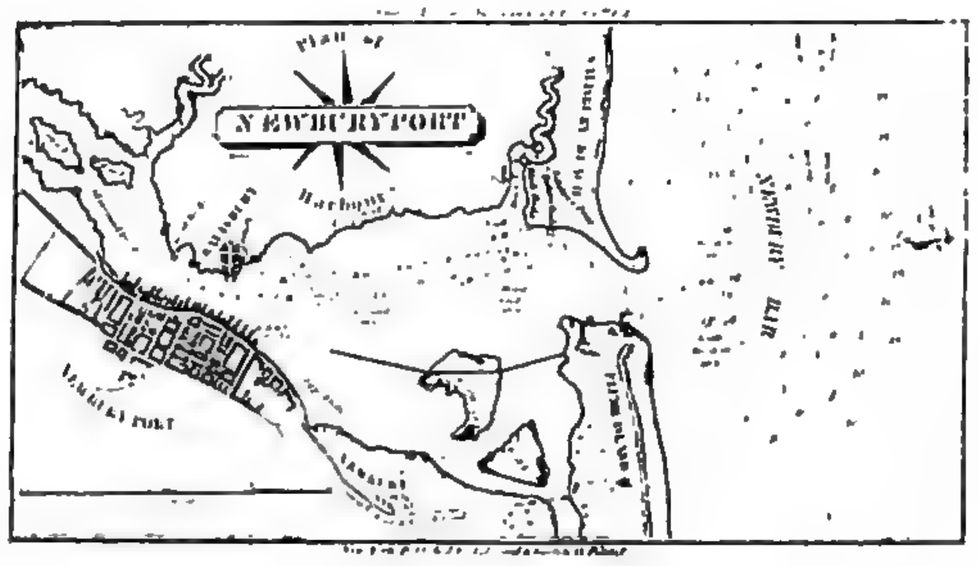

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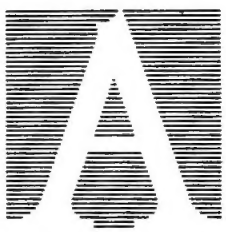

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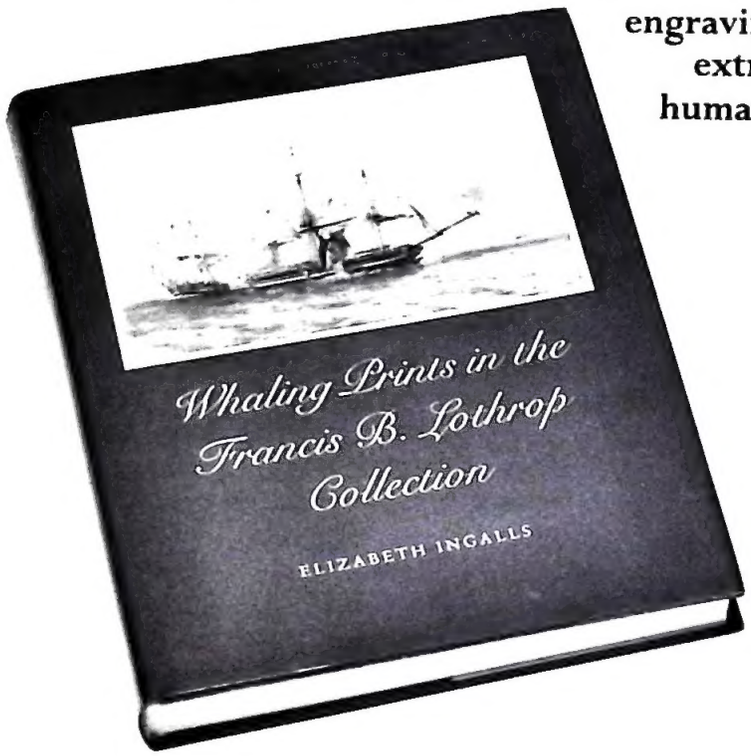

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8. Known Bondholders, Mortgagees, and Other Security Holders Owning or Holding 1 Percent or More of Total Amount of Bonds, Mortgages or Other Securities: *None.*
9. The Purpose, Function, and Nonprofit Status of this Organization and the Exempt Status for Federal Income Tax Purposes: *Has Not Changed During Preceding 12 Months.*

	Average No. Copies Each Issue During Preceding 12 Months	*Actual No. Copies of Single Issue Published Nearest to Filing Date*
10. Extent and Nature of Circulation:		
A. Total No. Copies *(Net Press Run)*	1,000	1,000
B. Paid circulation		
1. Sales through Dealers and Carriers Street Vendors and Counter Sales	000	000
2. Mail Subscriptions	866	825
C. Total Paid Circulation *(Sum of 10B1 and 10B2)*	866	825
D. Free Distribution by Mail, Carrier or Other Means, Samples, Complimentary, and Other Free Copies	53	54
E. Total Distribution *(Sum of C and D)*	919	879
F. Copies Not Distributed		
1. Office Use, Left Over, Unaccounted, Spoiled After Printing	81	121
2. Return from News Agents	000	000
G. Total *(Sum of E, F1 and 2—Should Equal Net Press Run Shown in A)*	1,000	1,000

11. I certify that the statements made by me above are correct and complete.

ANNE LIPNER, *Associate Director*

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